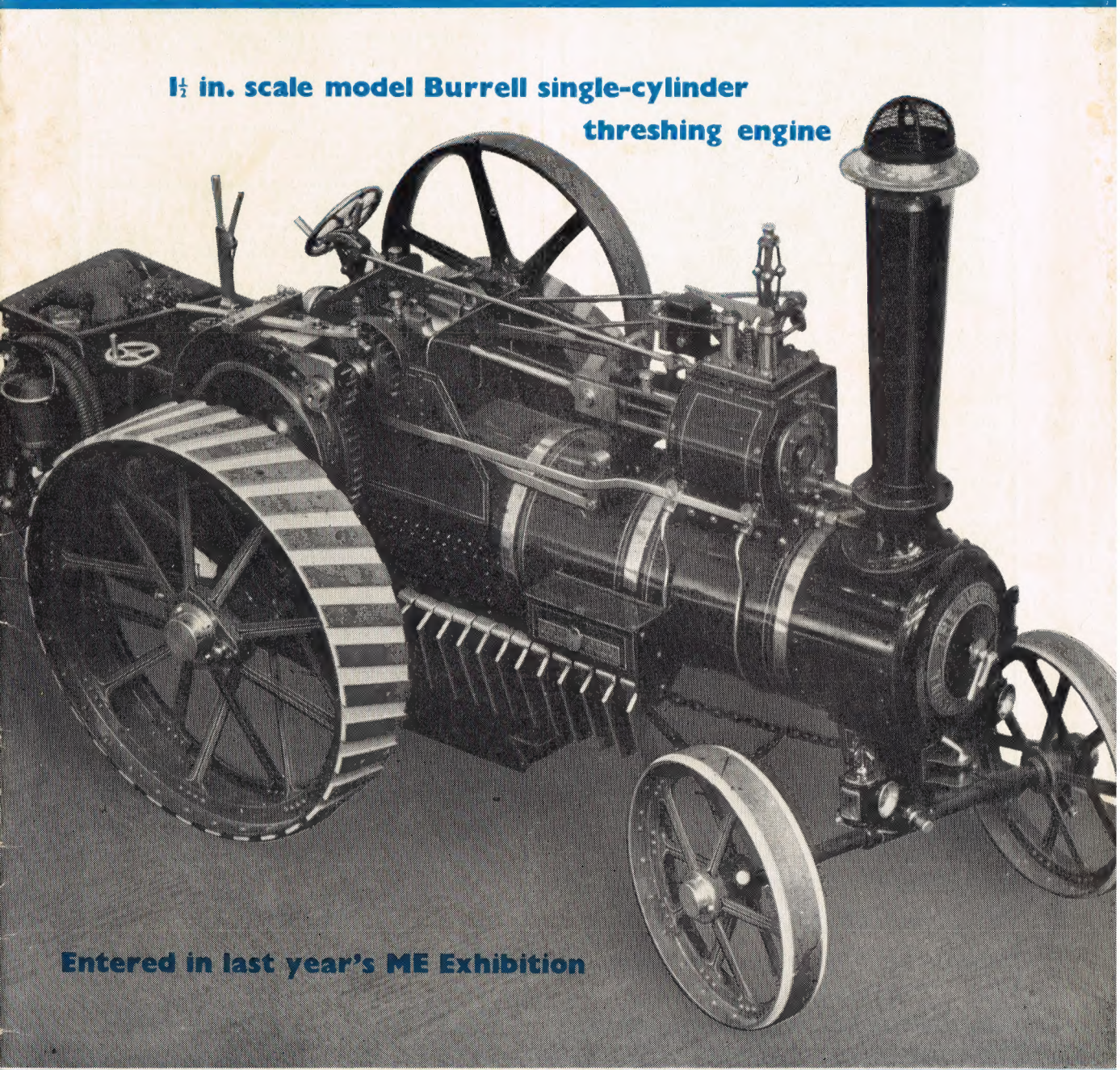
Model Engineer

THE MAGAZINE FOR THE MECHANICALLY MINDED



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ONE SHILLING 26 MARCH 1959 VOL 120 NO 3018

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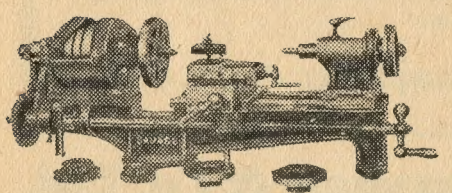

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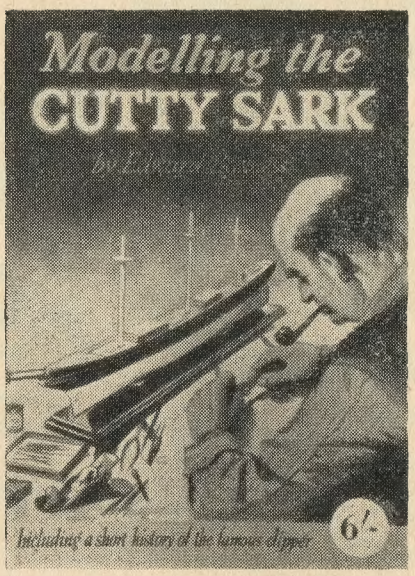
MR. BOWNESS is well known as a contributor to *Model Engineer* and as a foremost authority on ship modelling. The present book gives detailed instructions for building a $\frac{1}{16}$ in. to 1 ft. scale model of this famous old clipper ship. The scale has been carefully chosen to give just sufficient detail for realism without over elaboration. The illustrations will be found to be particularly helpful. They consist of a number of photographs taken by the author on board the ship and at the quayside showing various aspects of the vessel that are incorporated in the model. There are also a great many drawings and diagrams showing points of construction. These are typical of the author's careful and painstaking approach to his subject. Plates show the hull lines, details and dimensions of masts and yards and the rigging plan.

The author is noted for his thoroughness, and possible difficulties have been anticipated and solutions found. Furthermore, no hint or tip of use to the model maker is omitted. Although the book



includes all the constructional data which appeared in the recent *Model Engineer* series, there are several additional features: Firstly, he gives useful hints on the interpretation of drawings, choice of tools and purchase of materials. Secondly, there is a comprehensive glossary of ship modelling terms. And lastly, he has included a complete history of the vessel; in this he writes of the men who sailed in her and of her famous record breaking runs to and from Australia in the 1880s while engaged in the wool trade.

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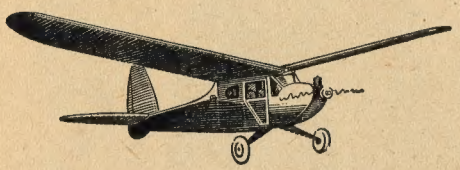

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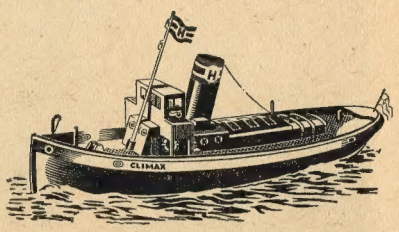

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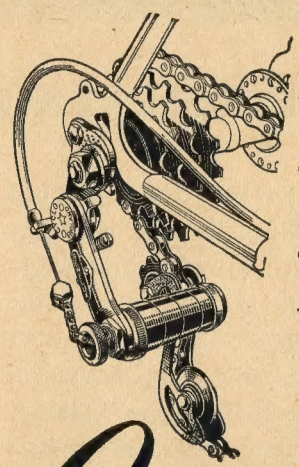

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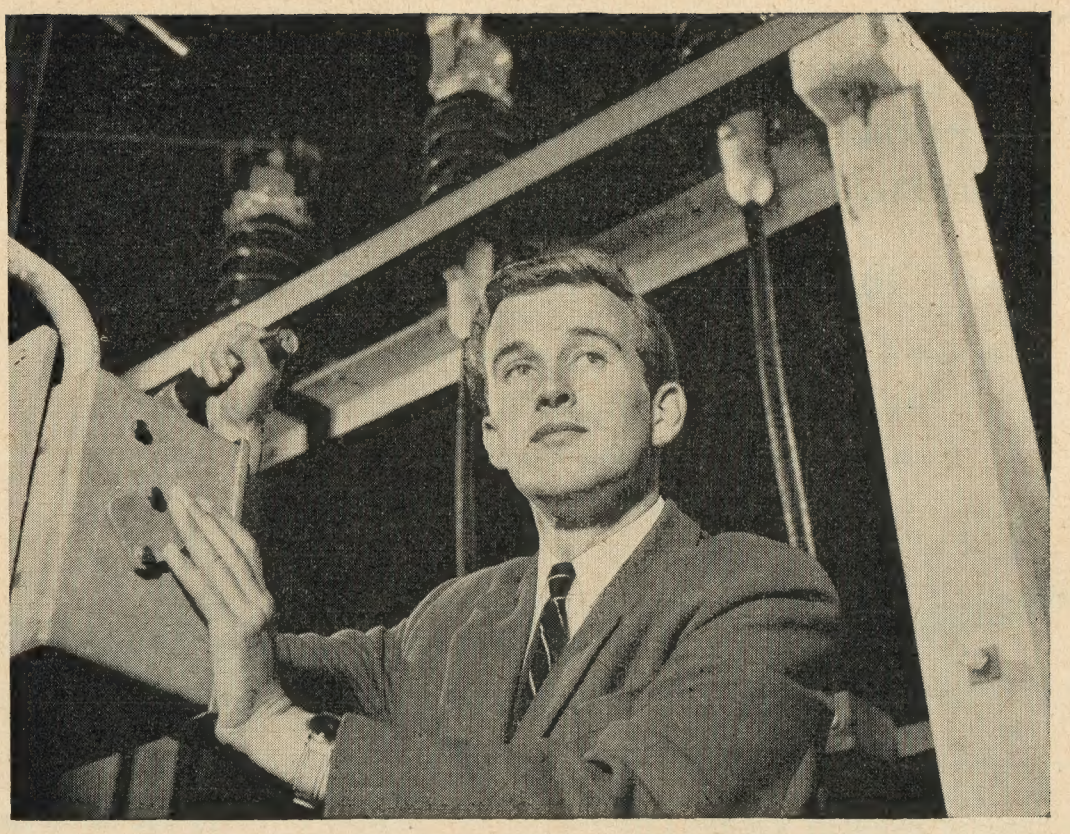

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NEXT WEEK

A small marine engine
Locomotives I have known
Railway topics
LBSC

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A WEEKLY COMMENTARY

Smoke Rings

By VULCAN

RAILWAY photography conjures up thoughts of pleasant moments spent on sunny banks watching a gleaming Pacific move into focus as it makes a masterly ascent of a tricky incline. Then comes the decisive snap of the finger and the locomotive thunders by, its dramatic moment claimed for posterity.

It brings up thoughts, too, of a muffled photographer, his Wellington boots buried in deep snow, stoically enduring the inclemency to capture the fierce flurry of the snowplough as it opens up snow-covered lines. Perhaps we might even think of the recorders, who set their technical cameras up alongside the big locomotive works to take pictures of the latest product.

Danger

None of these suggest the elements of danger, for traffic on the railway, compared to the crowded roads, proceeds at more leisurely intervals and there is usually ample time to set the camera and trip the shutter before the next train bears down.

With the intensive electrification programme now gripping the railways of Britain a new occupational hazard has presented itself to the cameramen. To give headroom for the catenary old bridges are being blown up and rebuilt and pictures of the actual explosion are eagerly sought by local papers and also by technicians, so no opportunity is lost to capture these dramatic moments.

The British Journal of Photography recently described how these pictures are taken, which is usually in the middle of the night. A robust hide, fabricated from old railway sleepers and well fortified with sandbags, is built at a vantage point near the bridge. While the photographers set up their half-plate cameras and arrange a battery of flashlamps, the demolition squad packs in gelignite charges—any number up to 50 may be used—and lays the detonators.

Zero hour

As zero hour approaches, the workers retreat to a safe distance, nearby roads are cordoned, a final check is made then the count down begins: "Three—two—one . . ." There is a flash from the bridge, and at the instant the shutter is tripped. Then several hundred tons of masonry and rubble cascade from the skies.

According to Jimmy Blake, a railway photographer, the odd thing is that the explosion seldom seems very loud nor is one aware of the battery of bulbs flashing.

Remote control

BRIAN DEVLIN is an Irish engineer who has been engaged for some time on the big electrical expansion programme on the west coast of the Emerald Isle. To use a term indigenous to his own profession, this has probably motivated the fusing of thought underlying an ingenious speculation.

Mr Devlin, a member of the Dublin society, told me during a recent call at Noel Street while holidaying in England, that he would like to build an original gauge O steam locomotive to run on the club's multi-gauge track.

His idea is to "fire" the boiler with an immersion heater of his own special design, and control the valve events and regulator by electrically operated remote control.

The difficulty, as we discussed it, was separating the different voltages. He is toying with the idea of using the track to supply the heavy voltage for the heater, which would possibly be 50, and employing stud contacts for the control, with different potentials actuating different relays.

Well, it is a fascinating idea and he has promised to let me know how he progresses.

Film shows

SECRETARIES of clubs who are looking for something different to entertain their members might consider looking through the *Films for Industry*, price 2s. 6d., the latest edition of which has just been issued by the Central Film Library, Government Building, Bromyard Avenue, Acton, London W3.

Though, as the title suggests, the films are intended for showing to the industrialist, there are a great many which would be of profound interest to model engineers. The engineering

section amounts to almost a third of the films listed and covers practically every aspect of workshop practice.

Can be adapted

A great many of the methods illustrated are applicable to the home workshop, while others, with a little ingenuity, can be readily adapted. Even those which have no direct relevance to model construction may prove interesting to an audience of club members.

The films, all of which are 16 mm., may be had in silent or sound versions, and in black and white or colour. Full particulars of their hire and charges, which are very reasonable, may be obtained from the address given above.

Five-year task

FOR five years Mr Raymond Frampton, an insurance clerk, has spent most of his spare time building an accurate miniature replica of a 10,000 ton tanker. Now it is nearing completion and may soon adorn the boardroom of the Athol Line, the company which owns the prototype.

Mr Frampton has taken meticulous care with the construction of his model, even the buckets, almost the size of pinheads, being to scale. The windlass, no more than 1 in. square and involving the making and assembly of 48 separate parts, is accurate to every detail.

Roving tickets

TO be able to travel freely over a given area and explore at leisure, yet in precise detail, the behaviour of his favourite locomotive must be the ideal of every live-steam enthusiast.

With steam locomotives disappearing from the public scene at an ever increasing speed, the enthusiast's efforts to photograph, observe and record the engines he loves must be doubled, or even redoubled.

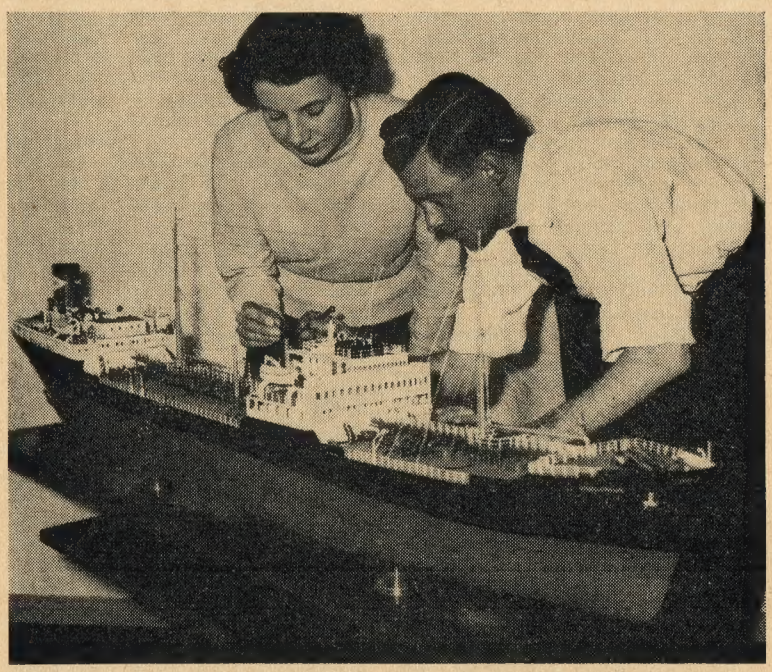
The Railrover tickets introduced last year on some sections of British Railways were obviously a godsend to many locomotive and train lovers, for they permitted unlimited travel by almost any train.

Increased areas

Eastern Region announce that the same facilities will be available this year, from March 1 to October 31, and that they intend to increase the boundaries to include travel between main centres bordering the regions in which the tickets are valid.

A ticket for seven days, issued on any day of the week, will cost £6 second class and £9 first class (children half price) and in addition there will be a general ticket giving unlimited seven days' travel throughout Eastern and North Eastern Regions for £9 second class and £13 10s. first class.

For the lucky enthusiast whose wife and children share his interests there are special reductions for families.



Mr Raymond Frampton, helped by his wife, nearing the completion of his model of a 10,000 ton Athol Line tanker

Cover picture

This 1½ in. scale Burrell single-cylinder threshing engine was built by Mr D. W. Harding, of Berkhamsted. It was entered in the Model Engineer Exhibition last year and although it did not receive a major award it was very highly commended.

Educational plan

EXCELLENT opportunities for the study of science are provided in the educational policy laid down by the Central Electricity Generating Board for its atomic research laboratories at Berkeley, in Gloucestershire. These new laboratories will employ over 150 people and promising candidates from the universities, technical and grammar schools will be able to train in the sciences with part-time release to attend local technical colleges.

There will be excellent opportunities for the study of engineering development in reactors, for the study of stresses in massive structures and for research into heat transfer, fluid flow, and various chemical processes.

There will be awards of full-time scholarships at appropriate universities.

These sandwich courses, in my view, are an excellent idea for they permit the student to cope with problems met with in practice while he is still studying. This has a two-fold advantage. It puts a brake on too much theorising—the danger of a completely academic training—and it allows technical skill to unfold at an earlier and more appropriate period.

Next week

MR A. BEAUMONT, of King's Lynn, a well-known contributor to MODEL ENGINEER, will describe a steam engine suitable for installation in model boats.

Edward Bowness continues his popular series on "Ship Modelling for Beginners," with details of a different type of rig for the model.

For the railway enthusiast and historian, Martin Evans contributes his third article in the "Railway Topics" series, which is proving very popular.

What to look for when buying

A CENTRE LATHE

Lathe versatility is more important than size, says MARTIN CLEEVE, who also discusses many other points of interest

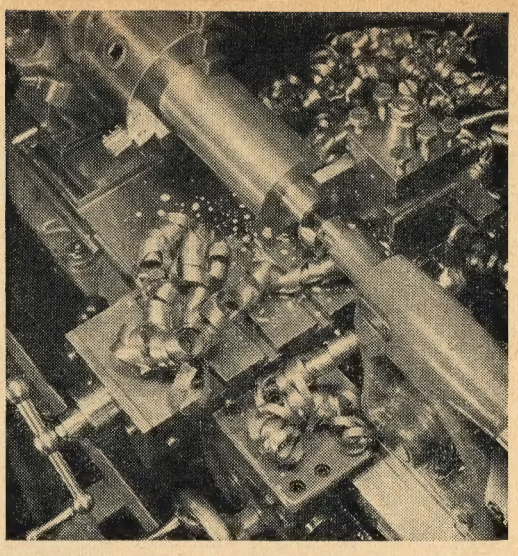


Fig. 1: A speedy roughing-down operation

A LITTLE while ago it was suggested that expensive and elaborate lathes could be put to wonderful use in the home workshop, and led as we are, to believe that the more we pay for an item, the more we shall get for our money, it is quite easy to assume that this applies to centre lathes as well. But from the amateur's point of view, although a high price will buy massiveness and elaboration, it is most unlikely to purchase versatility. The home mechanic is well advised to give careful consideration to what he expects his centre lathe to do before he commits himself.

The majority of lathes over the 3½ in. class are built almost solely for cylindrical and taper turning, hole boring and screwcutting (as distinct from screwmaking). The manufacturers quite rightly assume that if milling, metal slitting, gear cutting, cylinder boring, keyway cutting, and screwmaking are contemplated, the additional range of appropriate machines will be purchased.

Refinements

An expensive lathe might have an all-geared headstock, air-operated chucks, quick change feed and screwcutting gearbox, micrometer saddle dead stop, separate feed shaft and leadscrew, automatic cross-feed, taper turning fixture, built-in suds pump and pretty lights to show whether or not the motor is running: but it is unlikely to have a cross slide longer than is absolutely necessary to accommodate the topslide, and still more unlikely that the cross slide would reveal T-slots when the topslide is removed. Thus, for all the elaboration, the amateur would have the utmost difficulty in setting up even the most simple milling job.

Again, as rear toolposts are a comparatively rare fitment, the task of machining and parting a few special bolts would also be made unnecessarily tedious.

Taking everything into consideration, for the amateur who does not wish to buy a range of machines, the most important and useful feature for a lathe is a commodious T-slotted cross slide.

I am sometimes asked: "What's the hurry anyway?" The implication being that if it takes hours instead of minutes to set up a job on a lathe without a T-slotted cross slide, it does not matter.

In this respect, I think there are two classes of home workers: those who just like being in their workshops regardless of the end result, and those who like to get a job finished in order to start the next, and to whom incidentally, the next always offers more glittering prospects.

All lathe users will be familiar with the conventional way of roughly machining a bar of stock to form a step such as for the boss of a pulley. A knife-tool fed parallel to the work produces yards of thin and dangerous swarf which is apt suddenly to wind itself round the work, chuck and feed handles, but a tool such as that shown in Fig. 1, will remove large quantities of stock quietly and efficiently.

The unit is something like a wide parting tool. It has a cutting edge $\frac{7}{16}$ in. wide, a front and side clearance angle of 5 deg. (with a slight radius on the left-hand corner) and a back rake of about 30 deg., the steel being the usual 18 per cent tungsten, high speed.

The material being worked is ordinary mild steel (not the free-cutting variety) of 2 in. dia. The tool is fed by the cross-feed only, usually after advancing the saddle. The width of each cut is limited to about ¼ in., although for this particular picture, some cuts were taken with the whole width of the tool.

Backgear is used, the speed being about 150 r.p.m. and the feed about 1 or 2 thou per revolution. Feed rates, by the way, are easily estimated by watching the thou graduations on the cross-feed dial and listening to the backgears which more often than not make a distinctive noise at each revolution of the bullwheel.

As may be guessed, the load upon the tailstock centre is quite severe and in this respect it formed a further test for the practicability of the inserted high speed steel lathe centre described in Workshop Topics [ME, 11 October 1956]. This centre has been in use ever since, although on one occasion it was thoroughly overheated.

Tailstock support was being given to a small turning job rotating at high speed, and though the point had been oiled, smoke started coming from the centre.

There was another test, this time of durability. The end of the mild steel component was almost black with heat and the point of the lathe centre had bits of mild steel more or less welded to it. This is the kind of accident which a carbon steel lathe centre will not withstand. The point is invariably ruined, necessitating either regrinding or softening followed by remachining, hardening and polishing. However, after using a fine file on the component as it revolved in the headstock, the welded bits were removed without damage to the point itself. The temper of the steel had not altered and the centre was restored to service without further trouble.

It has often been said that the model engineer does not like production work or work calling for the machining of more than a few identical parts. I do not know whether this is true, but if it is, I must be an exception, I like production work. I also like making little gadgets to increase the efficiency of the set-up.

When most people buy a lathe for the first time, their thoughts automatically switch to watching the

turnings come off. I dare say that many, in the initial days of ownership, have searched for odd pieces of stock to machine to waste by the self-act feed.

I can well remember the thrill of setting up to make some No 2 BA cheese-headed screws with a friend. Although the die required a team of horses to persuade the work to rotate in it, and every screw had its quota of broken and torn threads, we could not have been more excited had we been asked to take the controls of the *Royal Scot*.

Since those days the task of screwmaking has been reduced to a fine art and, personally, when having a screwmaking session, I find it difficult to stop.

The lathe is perhaps the most expensive piece of machinery in the home workshop. It does not require much organising to set it up for screwmaking and the money saved in this way can be spent on things one cannot readily make, such as chucks and twist drills.

It was not so long ago that I purchased 144 ft of $\frac{1}{2}$ in. dia. bright mild steel for a job which failed to materialise. I decided to turn it into $\frac{5}{16}$ in. BSF cap screws of what may be termed (from the amateur's point of view) extra length: from $1\frac{1}{2}$ in. to $3\frac{1}{2}$ in., to avoid the irritating delay caused by not having them on hand when needed.

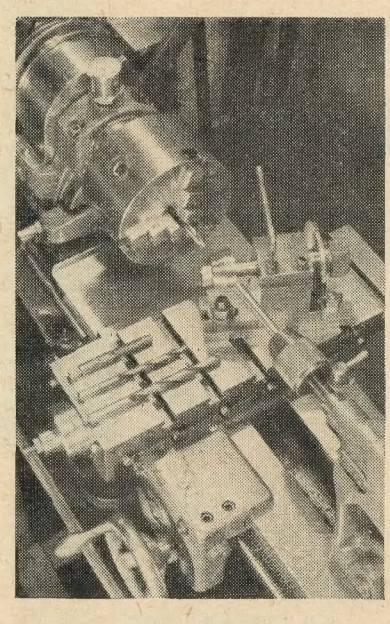


Fig. 2: *Simple cross slide indexing fixture. It is a useful device for drilling or tapping bosses, collars or flanges and other items of a similar kind*

At the time I had no travelling roller steady (of which more later). Consequently all screw blanks had to be machined with tailstock support, and to avoid undue strain on the lathe, two cuts were taken to bring the diameter down from $\frac{1}{2}$ in. to $\frac{5}{16}$ in. Things went badly. The turnings came off in long straight ribbons which suddenly wound into a compact roll in the usual manner, causing considerable delay. After tolerating this for an hour or so it was thought that if a tube could be arranged to convey the swarf to the far right-hand end of the lathe . . .

A piece of $\frac{1}{2}$ in. bore brass tube was fixed to the toolpost and so positioned and shaped that at the beginning of each cut, the turnings went straight in, and out at the other end, where swarf eventually piled up from the floor to higher than the lathe stand.

At the end of each cut it was necessary to pull out the length of swarf remaining in the tube: though it would sometimes be pushed out by the next length, it could not be relied upon to do so.

Occasionally the turning broke off inside the tube and caused a blockage,

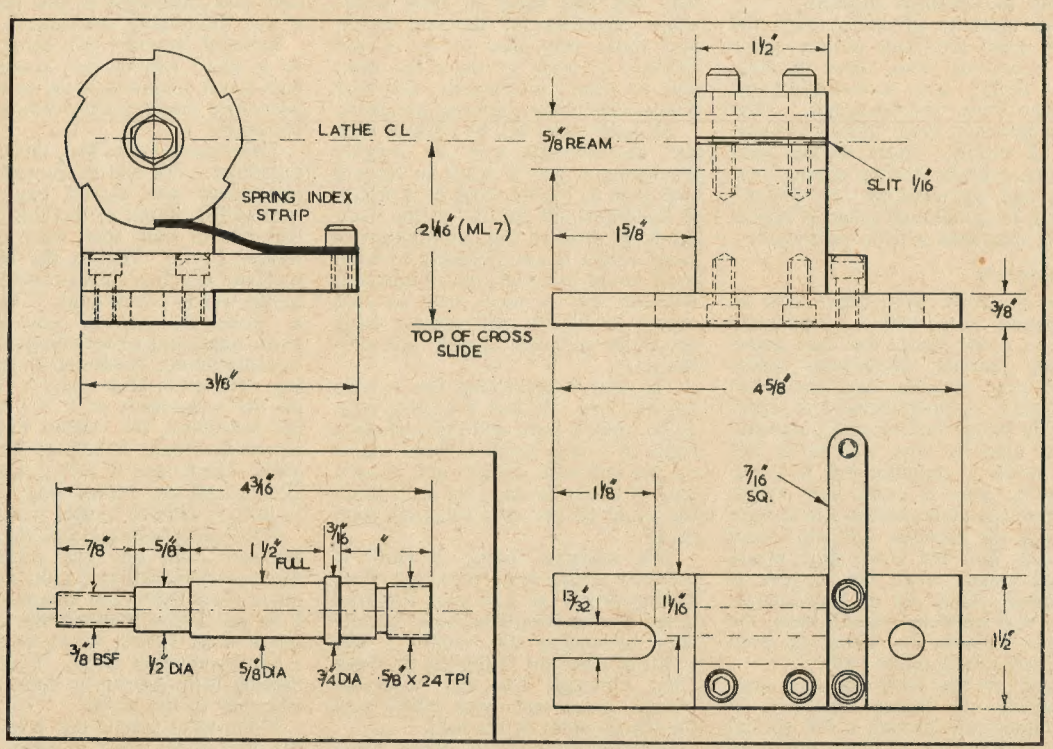


Fig. 3: *Index jig for lathe. Inset: A spindle for use with jig*

but the number of times this happened was not frequent enough to make it necessary to abandon the idea.

Apart from the novelty of the arrangement, perhaps its most charming aspect was the way in which the lathe remained almost spotlessly clean throughout the run, with just a drop or two of coolant here and there. (A brush was used to apply the coolant/lubricant—most of which went up in steam). To watch the diameter being reduced without so readily seeing the turnings at that point made it seem almost as though a trick were being performed.

When it's worth while

In most cases it does not pay to prepare a special fixture in order to make one or two parts. But in the case of a component such as a capstan handle boss, requiring three or four drilled and tapped holes equally spaced on an angular surface, a fixture was found to be well worth making. It gave accurate results both in spacing and in getting all the capstan spokes to lie in the same plane.

A typical set-up is illustrated in Fig. 2 which shows the drilling and tapping of a capstan handle boss for a skew-rack feed mechanism.

The jig is made on simple lines and consists merely of a baseplate and vertical 1½ in. square block with a ⅝ in. hole reamed at exact lathe centre height. The bearing in the block for the index spindle is split along one side to give a measure of adjustment and also to lock the spindle during machining operations.

The block is fixed to the baseplate by three or four cap screws passing up from beneath, and the baseplate has one plain and one elongated hole, the latter allowing for a T-bolt fixed at an angular setting.

The boss shown in the illustration required three holes, each tapped $\frac{5}{16}$ in. BSF, spaced at 120 deg. Having mounted the boss on the index spindle, the whole was set to the required angle by referring the angled-off face to the surface of the chuck jaws. The centre line of the angled-off surface was found and set by counting the turns of the cross-feed handle while referring to the point of a small centre drill held in the chuck.

After locking the cross-feed jib screws, each hole was centre drilled, drilled tapping size, slightly counter-drilled to ensure a clean entry for the component spoke, and tapped. A complete set of indexing movements was made between each operation, this being quicker than changing each tool to complete each hole between indexing.

In the case of a mild steel thread such as this, it is not worth straining the lathe in an attempt to finish right out. A seconds tap will give a good start to the threads, after which the boss may be removed and finished with a bottoming tap by hand.

The ratchet type of index plate shown in the illustrations is typical of a set made up for general indexing purposes. Of course, a lathe change gear could be used, but these are not always so convenient or safe, as there is always a risk of losing count of the number of teeth between indexing. The six "tooth" plate requires only two "clicks" per 1/3 turn, whereas a 60 t. change gear, for example, would call for a count of 20 "clicks" per index movement.

The inset drawing Fig. 3 gives details of the index spindle. It has been found that the double step serves very well for ⅜ in. and ½ in. holes in bosses, and for larger sizes a temporary sleeve may be used.

Heavy chucks

It may be asked, why not fit a spindle with a nose to take the lathe three- or four-jaw chucks? One of my first jobs 20 or so years ago was to make a tailstock adaptor for the lathe chucks. But it was found that out of their environment these heavy chucks had a most awkward feel and it was difficult to check for the accurate and concentric holding of the work.

Admittedly, the original tailstock adaptor was made for a Myford ML4 lathe with a tailstock barrel of only ¾ in. dia Another impression gained was of sag due to weight. This, coupled with the action of the key and keyway of the barrel, gave a most unfavourable impression of the whole. Later experiments with the fitting of a chuck to cross slide indexing arrangements gave similar unsatisfactory indications, so I have never looked with favour on the idea. ▣

Power driven ship models

by A. D. Trollope. (*Percival Marshall and Co. Ltd, London*). *Price* 15*s.*

THE rapidly growing popularity of model ships and boats has emphasised the need for accurate information on their design and construction. While the elementary ME handbook *Model Steamers and Motor Boats*, which has been popular for several years, still remains a useful introduction to the subject, the serious constructor will find in this entirely new publication a great deal more practical and comprehensive data on all aspects of power driven model ships than has hitherto been available.

In the first chapter the author deals with the choice of a ship for modelling, including the all-important matter of scale, and the amount of detail which may conveniently be included in a model intended for working. The elements of design are next discussed, together with essential principles of buoyancy and stability. Later, hull building methods and materials are considered including carving from solid, laminated block, framing and planking, also metal construction by the one-piece and plating methods.

The chapters devoted to power plant cover all practical methods of propulsion, starting with electric motors and batteries, and continuing with steam plants, from the simple impulse jet to reciprocating engines of varying types, and also steam turbines. Internal combustion engines suitable for prototype boats are suggested, but not described in technical detail. (Incidentally there is an error in the reference to the 1851 engine and further in stating that it was originally designed for the ME road roller!) Several designs for boilers suitable for model ship propulsion are described, together with means of firing them, also feed pumps and water circulation systems.

Propeller design is carefully surveyed and the value of experimental research in arriving at the most efficient size, pitch and type is emphasised. Methods of attaching the propeller, stern tube design, and shaft couplings are described in detail.

In the later chapters, practical advice is given on superstructure and deck fittings, davits, anchors, and winches, also fitting out, painting and finish. Appendices refer to running and maintenance, prevention of accidents, construction of ships' boats, building jigs, and a simple planimeter. Several photographs of outstanding models which have appeared at exhibitions and on sailing ponds are shown, and the only criticism in this respect is that there are not more of them. The general standard of the illustrations, however, is high, particularly the drawings, which give a clear explanation of the details dealt with in the text.—E.T.W.

DIESEL LOCOMOTIVE PIONEER

A consulting engineer with wide experience gives his views on today's trends in locomotive building

——By *Kyrle W. Willans*

IT must be unique for an engineer trained on stationary engines, traction engines and marine engines to have worked on both orthodox air injection diesel engines and steam locomotives. Yet such is my experience.

As part owner of a small engineering works, I was engaged before the first world war in repairing colliery and iron works locomotives. Later I handled the design and sales of Sentinel geared shunting locomotives and, in the early days of the compression ignition engine, my locomotive building career included the design and construction of pioneer diesel locomotives.

Looking back, I am conscious of the prejudice and dogmatic assertion which stifles British engineering. My father built enclosed type high speed steam engines in an era when possession of a beam was a *sine qua non* for steam economy. He and his partner were more or less forced to build yachts and launches in order to convince boat builders that enclosed type marine steam engines would work. In a letter in my possession addressed to his works manager my father stated quite bluntly that if he had considered popular opinion he would never have built compound non-condensing engines.

I think cheap coal has largely been responsible for the advent of the oil engine. In the early days of the diesel engine, before the first world war, coal was so cheap that however wasteful the steam engine may have been, it was still the cheapest form of motive power. We therefore squandered a fuel that could only be used once, the result being that we are within measurable distance of exhaustion of our coal resources, in particular coal suitable for steam locomotives.

Few experiments

When I went into the locomotive industry in 1912, one of the first things that impressed me was the absence of experimental work. I think I am right in saying that the death knell of the locomotive had been sounded before the full-scale testing plant for steam locomotives was set to work. In so far as the boiler is concerned, I think it was a French railway engineer who carried out tests with various lengths of smoke tubes to establish the nature of steam generation. Speaking from memory, I believe that nearly all the steam was generated in the firebox and the first 3 ft of tubes. But to this day the length of the boiler is determined by the space taken by the coupled wheels.

When my father was carrying out steam engine trials on his central valve engines, the test department boiler was a locomotive boiler bought, I think, from the old LSWR. Now although his engine was highly economical and although the boiler was equipped with an efficient forced draft, he could not get a total horsepower in any way approaching that obtained by the same boiler in a locomotive. At the time of his death he had planned to mount the boiler in a frame capable of being shaken to imitate the conditions met with in practice.

The first Sentinel geared 4 ft 8½ in. steam locomotive I designed and built was the conversion of an 0-4-0 Manning Wardle engine called *Ancoats* which started life on the Manchester Ship Canal. The boiler, tank, cab, cylinders and everything but the coupling rods were removed and a standard Super Sentinel lorry engine

Original Sentinel tractor hauling a 26 ton locomotive on trolley

and boiler fitted. The drive was by chain from the engine to a countershaft and thence to one of the axles. The engine went from works to works and the last time I saw it, was standing with engine and boiler removed, in a siding near Wellingborough waiting for the scrap merchant.

I went to the Sentinel Co. in 1924 to take charge of the industrial locomotive department and when I left three years later, more than 200 locomotives of one size or another had been built for industrial use only. Many more went into railway service. I can testify to the opposition encountered from believers in the conventional locomotive. The opposition was dogmatic and took the form: "If it is as good as you think it is, then why has it not been done before?"

The Sentinel locomotive was very economical. As compared with the normal 12 in. 0-4-0 it is not too much to say that you could run the Sentinel eight hours, including raising steam, on not much more coal than the conventional 12 in. locomotive took to raise steam alone.

Quarry problem

We developed trouble with the 100 b.h.p. Sentinel locomotive used on a 4 ft 8½ in. line when we failed to realise that a 12 in. locomotive in an ironstone quarry with a couple of miles of track could get up speed as its power rose, whereas our speed was limited by what we could get out of a pair of 6¾ in. × 9 in. cylinders. On the other hand most industrial locomotives of the conventional type were far too big for their work but could not be smaller or they would not start the load from rest. I well remember an occasion when, at Arlesley Brickworks an 0-8-0 LNER engine backed down on a rake of loaded brick wagons but could not start them. The driver of *Ancoats* suggested to the driver of the LNER engine that he move off a bit and then returned to his engine and pushed the trucks up to the big locomotive.

The Sentinel locomotive has a lot to recommend it and for industrial work it still deserves to be used in jobs where simplicity and reliability are of major importance. We were able to develop it in those far-off days largely because of its adaptability but more because of the low cost of engine and boiler. It was cheaper to fit the 100 b.h.p. engine to a 6 ton 24 in. gauge locomotive than to build a smaller engine fitted to a 20 ton 4 ft 8½ in. gauge locomotive. On small locomotives we used up an accumulation of old-style lorry boilers. These, incidentally, were much better boilers than the Super Sentinel boiler.

The first diesel locomotive I designed was built in 1928 and, like *Ancoats*, went all over the place. She ran for some time on the Welsh Highland Railway and later ran experimentally on the Festiniog.

It is incorrect to talk about the diesel locomotive as if it was something quite new and untried. It isn't. When the diesel locomotive was first built there was only one compression ignition engine available, viz: the McLaren Benz, but now there are many.

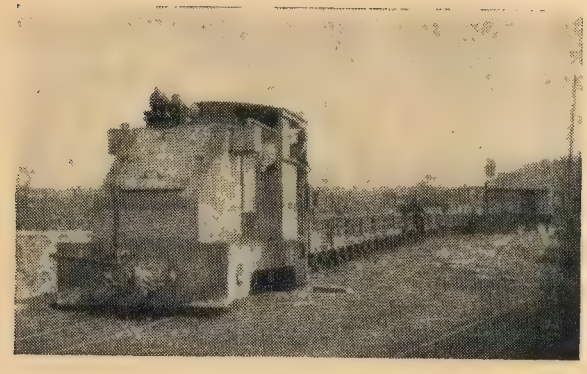
Without going into details as to the relative merits of steam locomotives and diesel locomotives, I can say from experience of the modern compression ignition engine afloat and ashore that it is silly to allege that they cannot, or do not, do the work required of them.

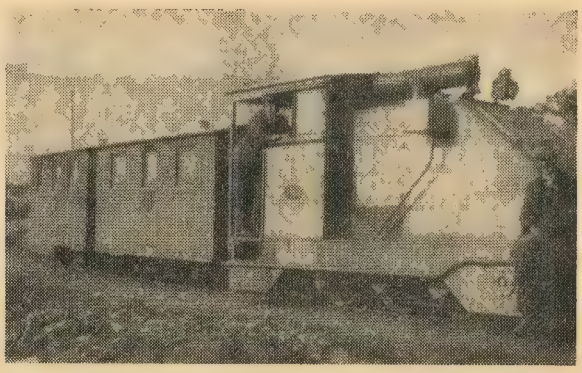
During the last three years of the second world war, I was in charge of the largest base on the west coast concerned with the refitting and repair of big tank-landing craft. These had two 500 b.h.p. 12-cylinder engines and were worked hard. Inexperienced men could completely refit one of these craft, including changing engines where necessary, in 4½ days.

If the railway authorities design locomotives so that the engines can be changed after, say 2,000 working hours irrespective of whether they need it, and if the engines are then methodically overhauled under clean conditions, the maintenance cost of diesel locomotives will be well below that of the conventional steam locomotive and the hours worked will be longer.

Obviously, the electric locomotive is the ultimate. But it is difficult to see how electric locomotives can operate without some other type of locomotive to work in the sidings and byroads. Surely this is the real field for the diesel locomotive?

I strongly object to running any locomotive single-handed, for reasons which should be obvious. To my mind, the oil engine locomotive can be economic without taking the risk of having only one man in the cab. In my view, the safety of the travelling public demands the presence of two men in the cab. I am convinced that the economies effected by the heavy oil engine do not require the additional saving of the fireman's wages. ▣





Two views of an early diesel locomotive made by Kerr, Stuart and Co. Ltd

MEASURING INSTRUMENTS

ANY model engineer seeking to get the greatest advantage from his measuring instruments would do well to obtain *Micrometer, Slide Gauges and Calipers*, by Alfred W. Marshall. Liberally illustrated, it explains in easy style the technicalities of simple and registering calipers, slide gauges, vernier scales and micrometer slide gauges. It is available from Percival Marshall Ltd, 19-20 Noel Street, London W1, price 3s., 3s. 3d by post.

ATOMIC SUBMARINE

MR D. ASHTON, of Sevenoaks, Kent, is now approaching the end of his four-year model making project which he started early in 1956. As completed his model will be one of the most complex ever designed. It is a fully-automatic radio-controlled model of the Royal Navy class O submarine Olympus, which was sunk during the last war. Mr Ashton has built the model from the original Admiralty working drawings and it is correct to the smallest detail.

The most remarkable innovations cannot be seen at a glance. First, the hull is formed completely from fibre glass. Within this structure ten torpedo tubes are installed, eight being set in the normal position and two as flash tubes. The torpedoes which fit the tubes can not only be realistically fired but they are fitted with explosive heads.

On the superstructure around the conning tower certain other devices are installed—first a set of Aldis lamps from which signals can be issued, navigation lights, a 4 in. gun which fires shells and a device whereby if the submarine should run aground an emergency buoy will automatically be discharged to mark its position.

However, not content with his ship being suitably armed, shortly after he had started it Mr Ashton decided to turn it into a nuclear-armed vessel by constructing a missile firing ramp on the deck and a device whereby rockets can be fired from under the surface.

The whole movement and working of these accessories will be controlled from the console controller which was also built by the same man.

According to the *Kent Messenger*, Mr Ashton hopes to enter it in this year's Radio Control Competition at Poole and also in the International Regatta at Paris. It is hoped to be finished in time for the next Model Engineer Exhibition.

TAPER TURNING ATTACHMENT FOR THE ML7 LATHE

By A. F. Ross

I HAVE had the greatest difficulty in the past in cutting an obtuse taper in my Myford ML7 lathe, as the toolpost cross slide can only rotate some 45 deg. on either side of the zero position.

Faced with a job of cutting a tapered recess in a piece of work held in the three-jaw chuck as in Fig. 1, I had to think out a way of rotating the topslide beyond the limits set by the makers. The small fitting described below is easily made to overcome the difficulty and allows a full circle rotation of the toolpost slide. A piece of ½ in. mild steel plate was machined in the lathe to conform to the dimensions shown in Fig. 2.

The first task after hacking the plate into a rough circle by sawing and grinding, was to drill and tap (¼ in. BSF) the four holes ultimately to be used for clamping down the toolpost slide.

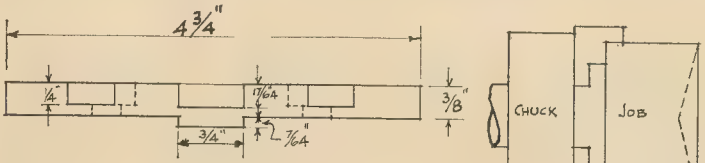


FIG.1

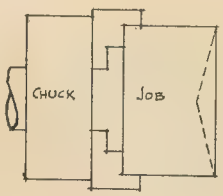
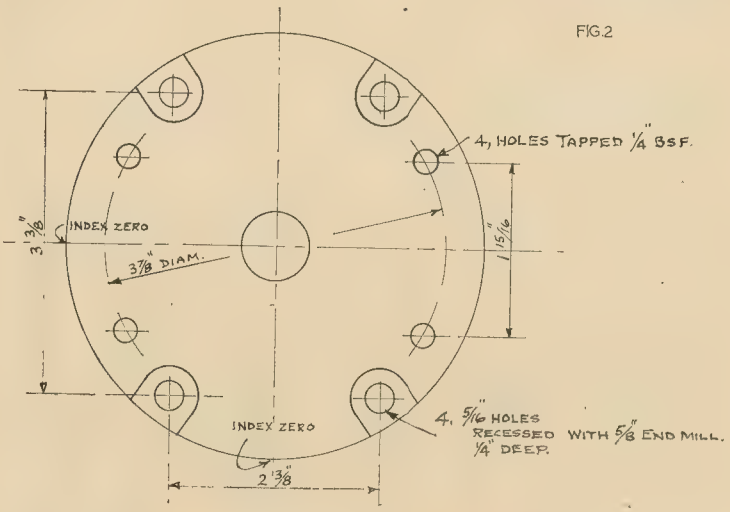


FIG.2



The plate is fixed to the faceplate by means of these holes with two ¼ in. BSF set pins screwed in from behind. It is next turned up to size, and faced, leaving a ¾ in. × 7/64 in. spigot which fits into the hole in the cross slide. The job is then reversed, carefully trued up and faced to ⅜ in. thick and bored in the centre ¾ in. × 17/64 in. to receive the centring spigot of the toolpost slide.

Special nuts

The four $\frac{5}{16}$ in. holes are marked off and drilled through and then milled out with a ⅝ in. endmill ¼ in. deep as shown. Four special nuts are made to fit into the slots of the cross slide and suitable ¼ in. BSF set pins made to complete the job.

It may be necessary to make a short extension piece for the handle of the toolpost slide in order to clear the handle of the cross slide when the two come into line. This presents no difficulty, though it is not shown on the sketches.

Like all gadgets of this kind, it has faults, the chief one being that the toolpost is raised ⅜ in. and necessitates the use of a much smaller turning tool. I find that a ¼ in. square shank tool can be adjusted quite satisfactorily to the lathe's centre height. If the cuts are not too ambitious and the extra time is of no consequence, the range of tapers which can be cut on the Myford is then unlimited. ▣

Facing and centring operations

By GEOMETER

IT is a sound principle, whenever practicable, to use the lathe for work which can be got on to it—even work which can be done by other means, such as filing or free-hand grinding. For the great merit of the lathe on simple work is its ability to leave end faces flat and square and corners on diameters finished with neat continuous radii or chamfers.

True, all sorts of pieces of material hacksawed from bar in the vice can be finished to length and "squared" to some degree of accuracy by hand filing. Outside radii can be filed on round bar held in the vice, or ground by twisting the end of the bar at an angle against a grinding wheel, and internal chamfers can be made with a hand scraper.

Chucking odd shapes

Any such hand-finished pieces subsequently set up in a lathe, however, will reveal considerable errors. Moreover, it may have taken an even longer time to finish them thus defectively. Hence, from every aspect, it is a sound principle to use the lathe when possible; and if time is needed to effect a set-up, it may well be regained, with the work made much easier and results far more accurate.

For short, odd-shaped pieces of material the most adaptable chuck is the four-jaw independent type, its reversible jaws with parallel faces and square steps providing for a variety of holds, particularly when supplemented by packing. Pieces of bar material of reasonable length can be easily chucked true with a firm hold. Non-solid sections, such as channels, T-sections, and angles like the angle iron, as at *A*, require appropriate packing, an edge or edges of which can be chamfered with a file for clearance.

Longer pieces of material, within the capacity of the lathe, may be centred at the end before chucking and the centred end then supported by a half-centre (or cut-away type) which will permit full advance of the facing tool. For angle material outside the capacity of the lathe, a set-up can be made as at *B*, and quite a small lathe can be used for facing long pieces. The tailstock is removed and a steady rigged for the tail end of a long bar held in the chuck. Wood blocks with a hole or Vs and bolted to the bench make a suitable steady. Then the angle iron can be held by clamps and the end faced close to the chuck.

If it is of large diameter and relatively thin-walled, setting up tubing for facing can be a problem—and a piece as for a boiler barrel needs to be neatly finished, even though that may not be functionally essential. A solution is to turn a large plug from a block of wood, centre and press it in the tail end of the tubing for support from the tailstock; then turn another block of wood with a stub on which the tubing can be forced. A keen pointed tool should be used with light cuts.

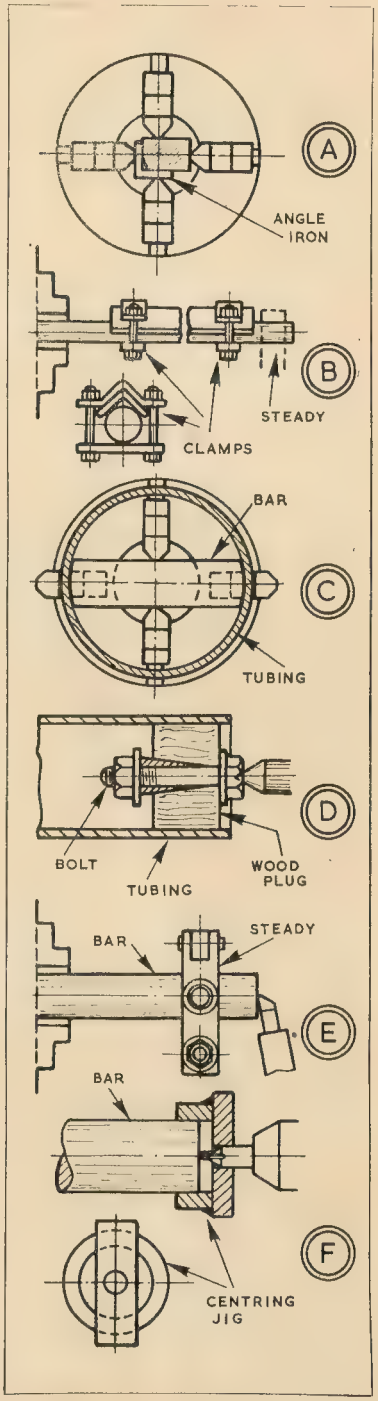
For facing tubing at the tailstock end, another method of setting up and driving is as at *C*. A piece of rectangular bar is scribed, sawn and filed sufficiently accurately to push inside. Two normally-fitted jaws grip the bar centrally, and two reversed hold the tubing over the ends. Packing here obviates marks.

Expansion plug

For the tail end of tubing, an expansion plug can be made as at *D*. In making the plug, it is drilled centrally, then used with a centred bolt, a piece of steel tubing tapered on the outside, two washers and a nut. Running friction on the bolt tends to keep it secure.

On solid material, centre positions for setting up can be obtained with a combination square. For other than round sections, the blade can be set to centre distance and used each side, scribing a series of lines. Marked with a centre punch, the position can then be centre drilled.

On round material, the centre head and blade are used for scribing. Alternatively, this material may be supported by the fixed steady, as at *E*, for facing and centring; and for long bars, a jig as at *F* can be made, using a ring brazed or welded to flat material. ▣



A 6 in. Circular Saw Bench

The fence and guide bar showing fine control on the right

N. KETTLE describes how to make the fine adjustment screw, ball race spindle, hinge pivot and platform

Continued from 12 March 1959, pages 314 to 316

THE $\frac{3}{16}$ in. reamed hole for the fine adjustment screw can now be located and after locking both the carriage and fine adjustment body as close as possible to one another on the guide bar jig, the place of the screwed hole in the carriage to take the fine adjustment screw can be determined.

This was done by holding the jig in the machine vice and passing a $\frac{3}{16}$ in. drill through the reamed hole in the fine adjustment body and through the nut plate on the carriage. The latter hole was carefully tapped $\frac{1}{4}$ in. Whitworth, taking great care to see that the thread was perfectly square. Failure to do this would have made the screw bind when in use, especially when the fine adjustment assembly was close to the carriage.

The fine adjustment screw was machined between centres in the lathe and the thread partly cut with a V-tool and finally finished off with a suitable die.

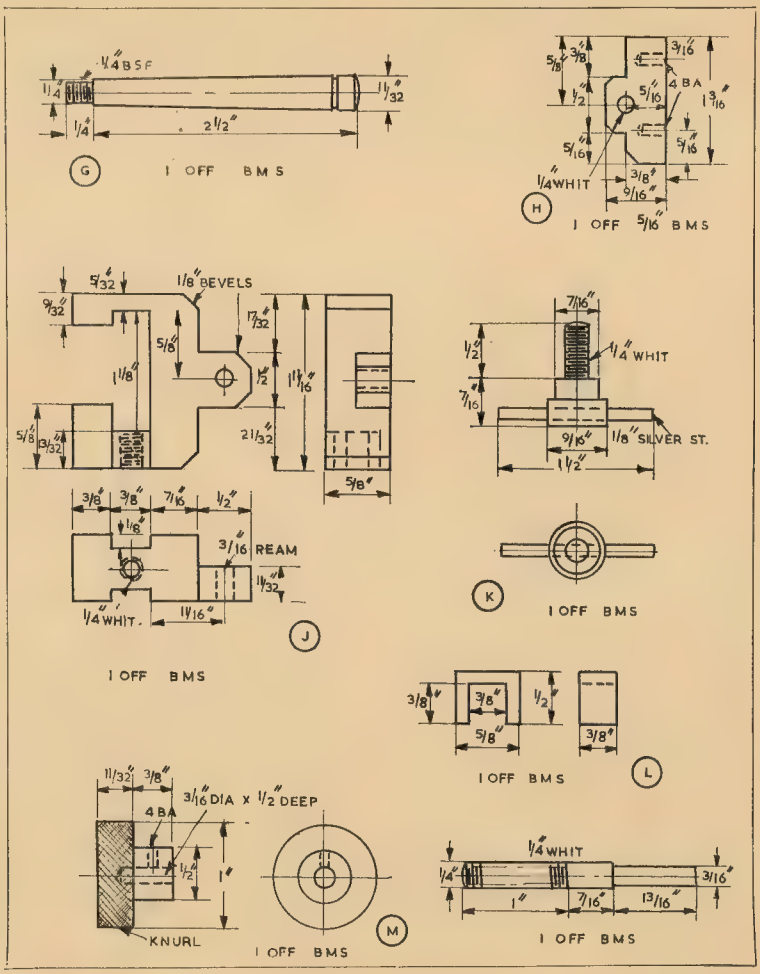
Control wheel

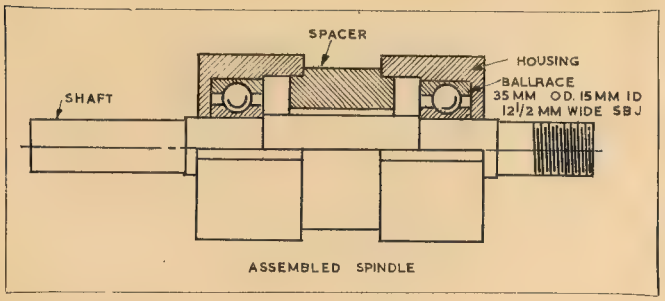
The control wheel was turned from a short length of b.m.s. and the perimeter grooved, after making a suitable jig, as described for the tilt control wheel. It would have been much easier to knurl this, but as I did not possess a knurling tool, I decided to groove it rather than buy one. The complete carriage and fine adjustment were mounted on the guide bar and the fine adjustment tested throughout its range.

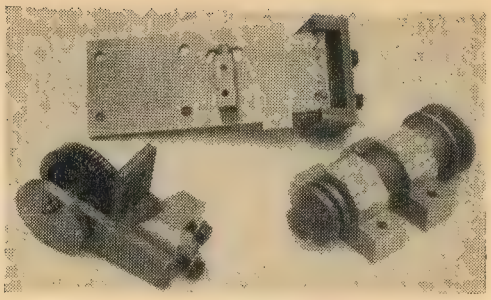
As this was satisfactory, a start was made on the ripping fence itself. This was cut from $\frac{5}{8}$ in. × $1\frac{1}{2}$ in. b.m.s. and finally endmilled to shape. The series of $\frac{3}{8}$ in. holes on the undersurface were drilled to lighten the fence without detracting from its sturdiness. The position of the holes for bolting to the carriage were determined and the holes drilled and reamed to $\frac{1}{4}$ in.

The front tapped hole was drilled in the carriage and the fence bolted down after ensuring that it was parallel with the slots in the table. The position of the second hole was marked by passing a drill through the requisite hole in the fence. This was tapped and the fence screwed into place. On testing, it was found to rub slightly on the table in use so a 5 thou shim was put between the fence and carriage and all was well.

The tilt degree indicator was not made at this stage. It was decided to leave it until the mitring protractor was tackled when both could be graduated on the one lathe set-up.







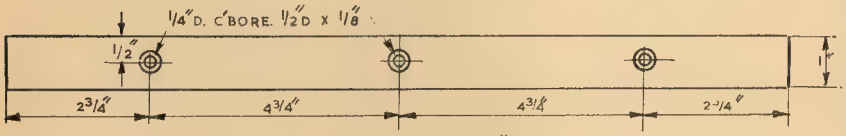
Spindle, platform and hinge

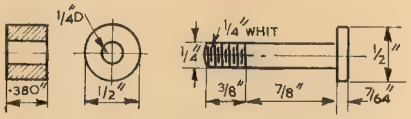
The ball race spindle consists of a left and right ball race housing in aluminium separated by a brass spacer, the ends of which are made a push fit into the inside faces of each housing.

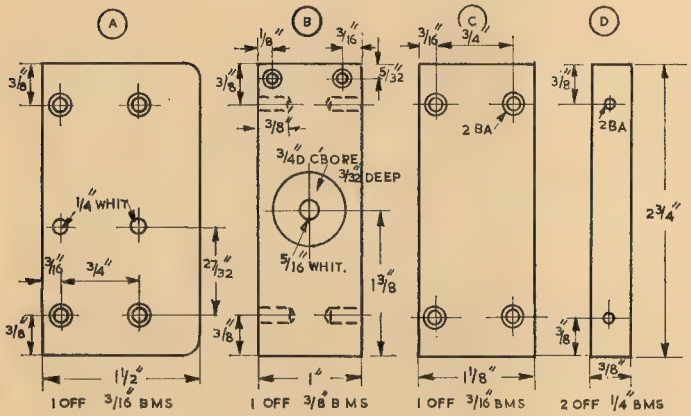
Two blocks of 2 in. × 1 in. × 3 in. aluminium were milled to size and the bore position marked on one of them. This was mounted on the faceplate and set so that the centrepop ran truly. A jig consisting of a length of ¼ in. × 1 in. b.m.s. with a recess 1/16 in. deep and 3 in. long was located against one side of the block and bolted in place. This made certain that the second block could be put in exactly the same place as the first when it had to be mounted on the faceplate, thus ensuring that the bore of each housing was exactly the same distance from the base.

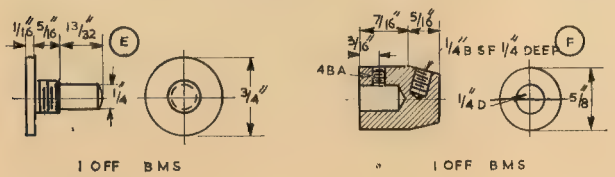
The bore was afterwards drilled and opened up to take the ball races and spacer as detailed in the drawings. The block was then removed and the second block machined after being arranged against the faceplate jig. The profile of both blocks was machined in the lathe by endmilling and the bolting down holes drilled.

The spacer was first bored and then held in an expanding mandrel, the outside diameter being trued up and the shoulders turned to a good push fit into the bearing housings.









Spindle shaft

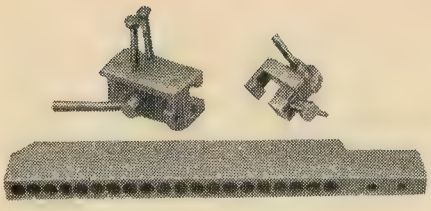
The spindle shaft was a straightforward piece of turning between centres and the thread was cut in the lathe to ensure squareness. A modification to the drawings must be made at this stage if it is intended to drive the saw from a rear mounted motor. The end of the shaft which takes the pulley will have to be increased in length so that the driving belt will clear the rear body plate. Alternative dimensions are given in the drawings.

The completed spindle was assembled on the surface plate after the races had been packed with grease.

The platform was cut from ¼ in. b.m.s. and the holes for the spindle assembly drilled. The hinge pivot was turned from ½ in. b.m.s. square and fastened to the platform with 2 BA screws.

The connecting rod slot and top bearing were not machined at this stage. The hinge bracket was built up as detailed in the drawings. The only point of note about this was that both end bearings were drilled and reamed together to ensure correct alignment of the pivot. The position of the tapped holes in the bracket backplate was not taken from the drawings but from the appropriate holes in the rear body plate. The following procedure was adopted.

A 6 in. blade was positioned on

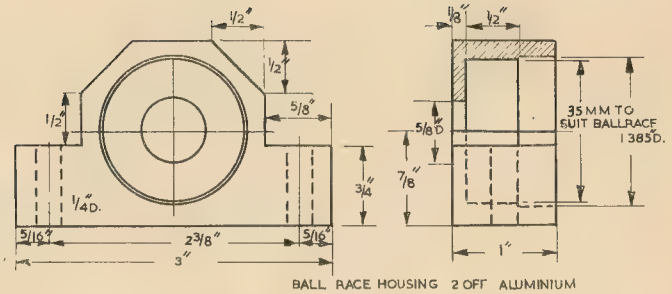


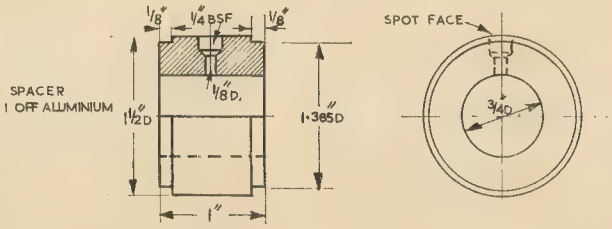
Fence, carriage and fine adjustment

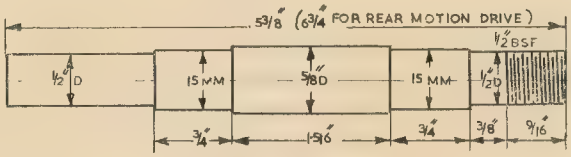
the spindle which had already been bolted in place on the completed rise and fall platform. This assembly was clamped on the rear body plate and adjusted so that the mounted saw was central in the table slot and square when the table top was horizontal. The position for the the tapped holes was then scribed through the rear body plate. These were drilled and tapped and the whole assembly bolted together.

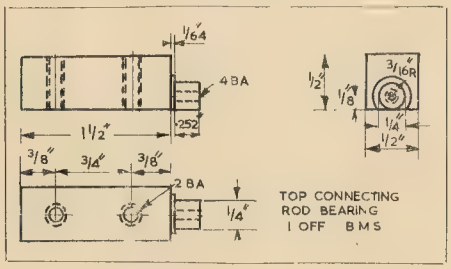
The control wheel of the rise and fall mechanism had to be on the front panel and rigid and self-locking in all positions. The mechanism was controlled by a worm and wheel. The worm shaft reached the front body panel too low to fix a control wheel directly to it, so a train of gears was used to bring the wheel to a more suitable position .

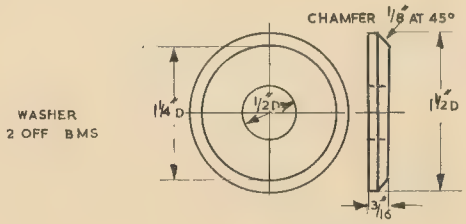
★*To be continued on April 9*

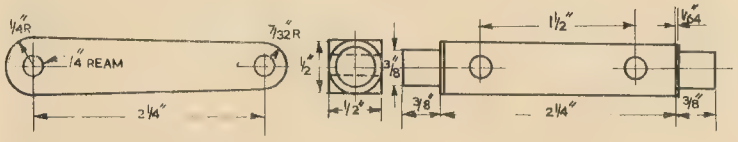


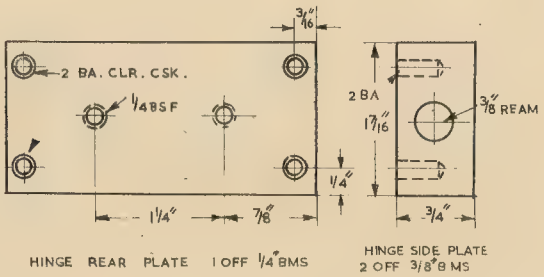












SHIP MODELLING FOR THE BEGINNER

SPECIALLY written for the beginner, *Ship Modeller's Logbook* by John N. C. Lewis, provides that background of information to a number of ship models which, so frequently, makes the difference between an outstanding model and a merely good one.

For this reason alone it will be found invaluable by all who are interested in ships. The book, which is well illustrated, contains 14 scale plans and over a 100 detail drawings. Among the building instructions included in the book are those for a decorative ship model, a small waterline model, a ship set in a sea, and a sailing model of a Grand Banks fishing schooner.

Making a Model Bicycle

R. POWELL says he constructed this model to prove that good work really is possible without an expensive workshop

THIS is a brief description of some of the methods used in the construction of the model bicycle I entered in the 1958 Model Engineer Exhibition.

One of the major snags in the construction of this type of model is the wheels. I knew that if these could not be made to look correct it was not worth carrying on with the rest. However, I had some rubber rings about 3¼ in. dia. and using these as a base, made the scale 1½ in. to 1 ft.

A start was made by machining the rims from dural bar. They were divided into 32 divisions while in the lathe and the holes for spokes drilled by hand using a No 48 drill in a pin vice.

The hubs which followed were also made from dural rod, divided into 16 divisions on each flange and drilled as before, by hand. I made a jig from plywood to hold the rims and hubs centrally and started spoking with 0.012 in. tinned copper wire.

The procedure was to thread one end of wire through the rim, bend a tiny right angle on the end and hook this through the hole in the hub. Then putting slight tension on the wire I bent it sharply round outside the rim and cut it off short.

This was carried out all round the rim using alternate holes until 16 spokes were in position. Rim and hub were then carefully removed from the jig, turned over and the job repeated on the other side. The wheels are strong even though they are held together only by the tension of the wire. With the wheels finished, a rubber ring was carefully pressed on and the result was extremely good.

The next item was the frame. It was made from odd bits of copper tube silver soldered together. Tiny lugs were added and the frame stays bolted on using 14 BA screws and nuts. The front forks are held by a thin $\frac{3}{16}$ in. × 40 nut and are able to swivel.

The mudguards were formed over a plywood jig from 0.010 in. aluminium foil and the mudguard stays fixed with 1/32 in. rivets. They are held in position on the frame with a 14 BA screw and the 10 BA nuts which hold the wheels in position.

The model was beginning to take shape and I pressed on with the saddle which was beaten up over a mild steel former and covered with thin rexine. The saddlebag was hand sewn from the same material. The handlebars were made from ⅛ in. dural wire and tiny rubber hand-grips were added. The chainwheel was turned as a washer and then spokes and teeth were filed in. The pedals were made from dural sheet and tiny bits of ebonite filed to square section and held together with 1/32 in. aluminium wire riveted up.

The chain is not easy to make and I thought of leaving it off. Eventually I made it by taking a piece of wood 12 in. × 1 in. × ¼ in. and stretching two bits of 0.010 in. wire 1/16 in. apart, along it. Then starting at one side I wound wire all the way down leaving $\frac{1}{16}$ in. spaces and soldered each wire where it touched. By cutting away all the loose ends I was left with a small wire flat link chain.

There are a lot of small items which were added, most of them hand-filed from scraps of dural, such as the brakes, head and rear lights, dynamo and a pump, which works, and is fitted with a spring. All the work was done on the kitchen table except for the turning. I used a 3⅜ in. Zyto plus ¼ in. bench drill and made the the model to prove that an expensive or elaborate workshop is not necessary to turn out good work. ▣

FOR YOUR BOOKSHELF

Railway Signalling Systems, *by John R. Day and B. K. Cooper.* (*Frederick Muller Ltd.*). *Price* 9*s.* 6*d.*

IT is probably true that railway signalling, as developed on the railways of Britain, is the safest, simplest and most reliable in the world; and, although the latest developments, wherein colour-lights replace semaphores, tend towards even greater simplification, the safety factor remains as the principal feature.

This excellent little book deals fully with the whole subject, from the earliest times to the present day. In clear, non-technical language, it describes every signalling system that has ever been used in Britain, goes quite deeply into the advantages and disadvantages of each, how and why certain improvements were introduced from time to time, and explains not only the signals but every item of mechanical and electrical equipment.

The well written text is backed up by numerous excellent illustrations, so essential to a book of this nature. It is clear that every possible care has been taken to produce a thoroughly readable, informative and altogether useful textbook free from the rather dry-as-dust quality by which they are so often characterised. We heartily recommend the volume to all who would know what railway signalling is and means.—M.E.

VICTORY
ON THE EVE OF BATTLE

Continuing his series on this famous ship, C. BLACKMAN tells of work on the after cabin, quarter galleries and the running rigging

Continued from 12 March 1959, pages 322 to 324

UNFORTUNATELY the sycamore did not produce much wood suitable for modelling, though I got sufficient to do the planking above the waterline. I was unable to get any pieces large and straight enough for the lower and middle decks of sufficiently good quality, so I had to fall back on the best bits of the African woods.

These were certainly easy to work, of short grain and free from warp, but softer and darker than I liked, as can be seen in Figs 5 and 6, which also show the cable bitts, some gratings and the chain pumps.

Painting was carried out bit by bit as the building progressed, since it is next to impossible to get the strakes even and free from a "dog's leg" once the gun ports are triced up and the guns mounted, chain plates and chains secured and so on. The formula for the yellows which was found in the boatswain's store, was half white, half ochre.

The stanchions on the upper deck supporting the skid beams, and also the three which support the fore-ends of the lower caps are ornamentally turned. They would be extremely difficult to make from the solid on such a small scale so I built them up from square and round-sectioned wood in the following manner. Two pieces of square section were drilled longitudinally to take a piece of round section and a piece of square section glued to each end. The method is shown clearly in Fig. 7. I was fortunate in having a quantity of chain whose links, when made circular, were a good sliding fit on the pillar. This saved a lot of time and trouble.

Luxury for the Admiral

The Admiral's after cabin was, for me, a work of devotion. I fitted it up with bulkhead and double-doors hung on hinges and panelled. The deck was covered with the Regency style canvas usual in those days. As the Admiral was known to have been in his cabin until just before action was joined, I placed in it a chair which is a copy of the original, and a table with an ivory top just half the size of a postage stamp. On the ivory I was able, after several attempts, to engrave (perhaps scratch is a better word) with a scriber the famous prayer found in the cabin after the Admiral's death:

"May the great God whom I worship, grant to my country, and for the benefit of Europe in general, a great and glorious victory; and may no misconduct in anyone tarnish it: and may humanity after victory be the predominant feature in the British Fleet. For myself individually, I commit my life to Him that made me and may His blessing alight on my endeavours for serving my country faithfully. To Him I resign myself and the just cause which is entrusted to me to defend. AMEN-AMEN-AMEN."

A rub with Indian ink and the words showed up clearly with the aid of a watchmaker's glass. They

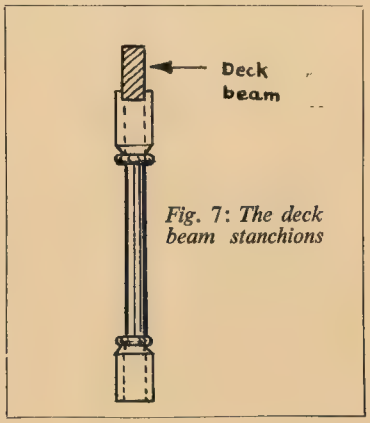


Fig. 7: The deck beam stanchions

can be seen, though not read, in Fig. 8. It will also be noted that I used the galley funnel as a stanchion rather than cut the deck beam which unfortunately came in the way. The galley funnel on the forecastle was made from a 0.22 copper cartridge case which I found to be exactly right. File a V near the top and bend it over to the correct angle. Solder wire round to fill up the crank and solder on the two guides for the rods of the funnel cap. Drill a hole through the cartridge cap and screw to the deck and the dummy funnel on the deck below.

Quarter galleries

Looking back, I think the quarter galleries were the most difficult part of the model to make. The trouble, as with the cant frames, is to find anywhere from which to take really accurate measurements, together with the fact that though one has a bird's eye view while making them, they must yet look correct from sea level at all angles. Although paper or cardboard patterns can be cut and altered until they look perfectly good, the wood cut from these patterns will not conform in the same way. I think I made about seven before being satisfied with both sides.

It was now time to think of items of the running rigging which are secured under the quarterdeck and gangways, and therefore cannot be got at once decks are secured. Their number depends on whether the model is going to be semi-rigged or properly rigged. If the latter, these ropes are: fore sheets, main tacks, and after guys of fore stunsail boom which are secured to staghorns and cleats between the guns under the gangways; and main jeers, main topsail sheets, and main clew garnets which are secured to bitts below the quarterdeck, before and abaft the mainmast.

Fig. 6: *Cable bitts, gratings and chain pumps of HMS* VICTORY

All must be secured and one end coiled on deck, the other being passed up on deck or out through the ship's side when the decks above are being secured. This, of course, means that the hauling part of these ropes becomes the standing part, which entails a bit of bother later on when the standing part has to be used as a hauling part. The tiller ropes, too, must not be forgotten, coming up through each successive deck as it is secured. All guns with their breechings, tackles and quoins must be dealt with deck by deck.

It is also advisable to make sure that all the ringbolts are in place and thoroughly secured against the possibility of drawing out. Considerable strain can fall on many of these bolts when setting up the rigging so I always solder a tiny washer on the underside and, in addition, squeeze the end of the bolt with a pair of strong pliers.

★ *To be concluded on April 9*

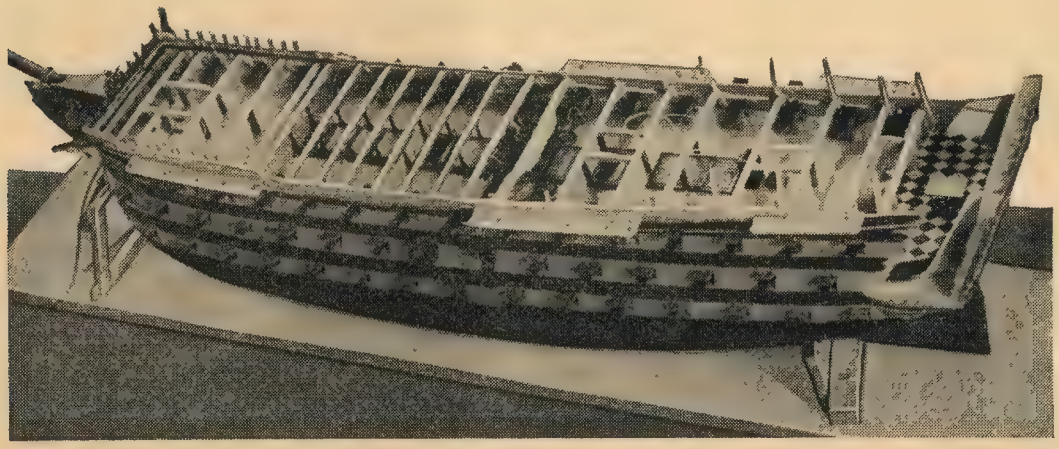
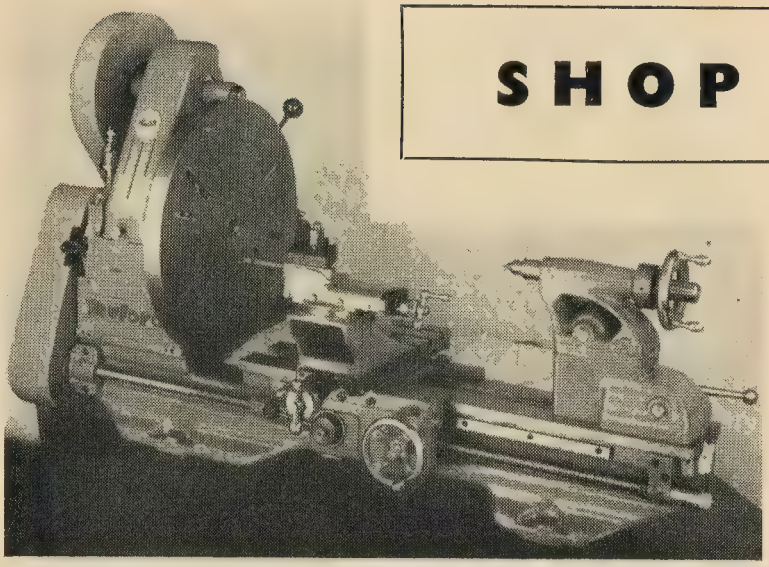


Fig. 8: *View of HMS* VICTORY *with ivory-topped table on which is inscribed Nelson's famous prayer before the Battle of Trafalgar*

SHOP CHAT

in which LBSC speaks of a lathe for locomotive builders, how to mend blowholes in cylinder bores, and devise a box-spanner by using Allen screws



ML7 high-swing lathe made specially for use in mobile workshops servicing international motor race meetings

CORRESPONDENTS often ask, why not Shop Chats as well as Lobby Chats ? They say that in my long experience of locomotive building, there must have been problems to solve, ways and means of doing various jobs and other happenings worth recording. Quite true—and as there is no time like the present, I'll begin right away.

In my observations on lathes [ME, January 15], I gave a diagram of a lathe designed especially for the use of locomotive builders. It was a sort of universal machine, capable of doing not only all the turning from large driving wheels to tiny injector cones, but all the milling required. It could also be used for rapid repetition work such as making screws, bolts, boiler stays and what-have-you. I received several letters commenting favourably on the machine, but the most interesting and practical was that from Mr Cecil Moore, managing director of the Myford Engineering Co., Ltd.

Anticipation

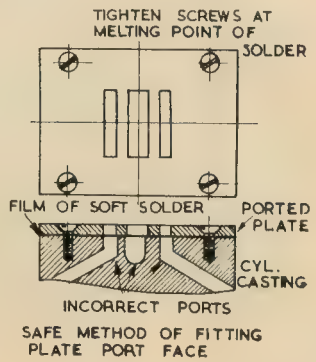
Mr Moore said that his firm had already gone some way towards my idea of a high-centre lathe, and sent me a batch of photographs to illustrate it. Early in 1951 a well known firm of brake-lining manufacturers who send mobile workshops to service brakes at international motor racing meetings both in this country and on the Continent, required some fairly light lathes with high centres. They were for truing up the large brake drums used on racing cars, and obviously the ordinary type of large lathe on which the brake drums were machined, would be quite out of court for a mobile workshop.

The Myford folk soon met the brake firm's requirements by fitting some of their standard ML7 lathes with a set of raising blocks. That under the headstock was of the ordinary type, but the block for the topslide had to be of special pattern, to enable the boring tool to be mounted at a distance from centre equal to the radius of the brake drum. A special block was also needed for the tailstock, as can be seen in the illustrations An outsize in faceplates was another special requirement, on account of the size of the brake drums. The gearwheels naturally had to be rearranged to suit the extra centre height.

The raising blocks are still available, and would go a long way toward converting a standard machine to the suggested " LBSC special," inasmuch as quite a big cylinder casting could be mounted on an angleplate for machining. A large angleplate bolted to a vertical slide on the saddle would provide a milling table with sufficient rise and fall for most locomotive jobs, the cutter being mounted either on an arbor between centres, or on a stub mandrel held in the chuck. Small commercial capstan heads for tailstock mounting are already available. I have had a little six-station turret for many years. It cost only 18s. and has a taper peg to fit the hole in the tailstock barrel. The stations are located by a spring plunger when the turret is revolved by hand.

The second illustration shows one of the raised-centre lathes fitted with a draw spindle and a twin-tool box-type turret for regrooving pistons when fitting special rings.

The most interesting part of Mr Moore's letter says that he is rather impressed by my idea of a locomotive-builders' universal lathe, and is inclined to have a crack at producing it. As I stated previously, it might have been on the market many years ago but for unforeseen circumstances. At the moment, Mr Moore is touring the United States and Mexico, but when he returns next month, there is a possibility that he will be paying me a visit with one of his designing staff. We can then go into full details. Anyway, if the Myford firm takes up the production, there will be no question about the workmanship and accuracy.


TIGHTEN SCREWS AT MELTING POINT OF SOLDER
FILM OF SOFT SOLDER
PORTED PLATE
CYL. CASTING
INCORRECT PORTS
SAFE METHOD OF FITTING PLATE PORT FACE

In reply to querists who asked for further details, the idea is to have a machine of great capacity while being built as simple as possible. The motor would be mounted low down on the stand (inside a cabinet stand) with a drive to an overhead countershaft carried by two supports attached to the stand. With two flat pulleys on the motor spindle and two corresponding pulleys on the countershaft, plus a three-speed cone and backgear, there would be 12 speeds. Flat belts would be used, easily changed or replaced. Being able to pull the belt by hand for small screwing and similar jobs, is an advantage. There would be a simple self-act with tumbler reverse. With an adapter duplicate of the mandrel nose in one of the turret holes, and the big faceplate on the adapter, the lathe becomes a horizontal drilling machine. Work could be held in a machine-vice bolted to the faceplate. I hope to give further details of these developments later.

Some of the locomotives that I overhauled in the old days at Norbury had wrongly cut or ragged ports. I invariably corrected them by the age-old dodge of machining about 3/32 in. or so off the defective portface, and fitting a fresh portface with correctly cut ports in it. I never used soft brass, but either a piece of bronze plate, or a steam chest cover casting made from the same kind of metal as the cylinder. This was machined on both sides to a thickness greater than required and the ports cut in it.

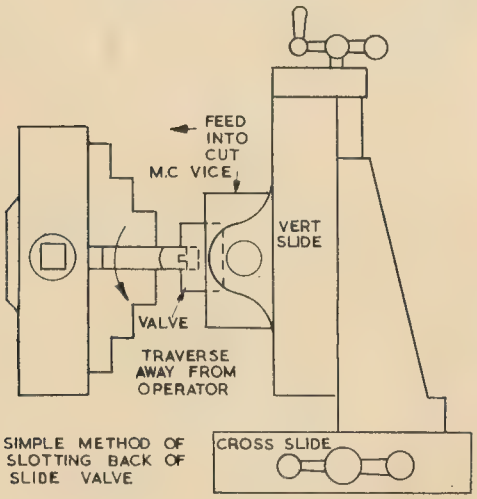
It was attached to the cylinder casting by screwing and sweating, *never by silver soldering*. To heat up a finished casting to the degree of redness needed for silver soldering is just asking for trouble. Both the bore and the portface will distort and some castings will become porous at a red heat. My pet method was to drill a countersunk hole in the ported plate at each corner, temporarily clamp it to the cylinder, and drill and tap holes for countersunk brass screws. The plate was removed and the contact faces of both plate and cylinder heavily tinned with ordinary solder. The plate was then screwed to the cylinder, with a brushing of liquid soldering flux between.

The next item was to heat the assembly carefully until it attained the melting point of the solder. As soon as this was reached, the screws were tightened down. Any surplus solder was thus squeezed out, and what remained formed a perfect seal between cylinder and plate. All that was needed was to set up the cylinder in the lathe, and take a cut over the new portface to true it up and bring it to correct thickness, finishing with a rub on a piece of fine emerycloth laid on a surface plate. This method obviates distortion of the casting.

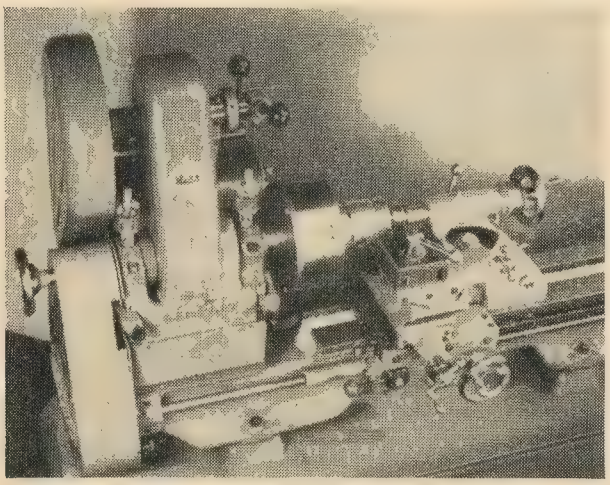
Beginners sometimes asked if I could suggest a way of dealing with a small blowhole in a cylinder bore. It is certainly vexing when one has spent hours of laborious and patient labour on a cylinder casting to find this trouble. Suppliers will always replace the casting, but most folk begrudge the extra labour of machining a fresh one. My remedy was to fill the hole with soldering fluid and put a small blob of white-metal, as used for motor bearings, over the hole. The casting was then slowly heated up until the metal melted and filled up the hole. Putting a parallel reamer through the bore easily removed any surplus metal; alternatively the cylinder could be set up in the lathe and a skim taken out of the bore to true it.

This repair is permanent. One of my own engines has a cylinder with a filled blowhole (a test job) and it has lasted about 25 years. The metal was the kind used in locomotive axleboxes and big-end brasses, known as Hoyt's copper-hardened, but any kind will do. White-metal can also be used to cure another beginners' worry. When drilling steamways, the drill sometimes runs off the road and pierces the exhaust port, or suddenly makes an appearance on the portface. In the former case, cut a piece of brass wire of the same diameter as the drill to the length of the port bar, insert it in the unwanted hole in the exhaust port, and seal it with a few drops of soldering fluid and a small blob of white-metal in the port. Heat the casting until the metal melts, then tip it up so that the plug is covered. For a pierced portface, put a piece of wire in the hole reaching from the end of the bore to about $\frac{1}{16}$ in. below the portface. Apply soldering fluid and a blob of white-metal to the hole in the portface, heat until the metal runs and fills the hole, then smooth off the portface—and be mighty careful when re-drilling !

It isn't a far cry from portfaces to slide valves, and many a beginner has made a mess of cutting the exhaust cavity in the face. Incidentally, a locomotive slide valve has a face, two ends, two sides and a back, and they all need special treatment. In the case of a spoilt face, a new one can be fitted, and in this case silver soldering *can* be used with advantage. The defective face should be machined off



SIMPLE METHOD OF SLOTTING BACK OF SLIDE VALVE



Special items on this ML7 lathe are twin tool turret and draw-bar for regrooving pistons when fitting rings

to the depth of the cavity, if this is of the usual shallow kind, as used with a slotted-back valve. The thickness of the new face should be a little over the exact dimension, to allow for truing. It should also be longer and wider than required, and of bronze or a good hard non-ferrous alloy.

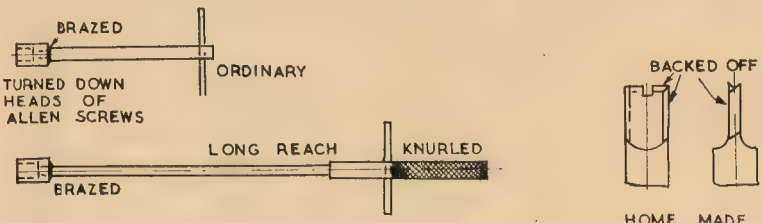
First cut the cavity by drilling and filing, the width being the same as the length of the ports, and the length being such that the inner edge of each steam port is just visible as a black line. This allows for a slight exhaust clearance. Some builders aver that exhaust clearance isn't required, but it is one of the reasons for the success of locomotives built to my instructions. In Mr O. S. Nock's article in the February *Locomotive* there is an account of an LMS 4-6-0 which had its original valve arrangement altered to wider ports, shorter steam lap and some exhaust clearance, which was a considerable improvement.

The new face can then be located centrally over the body of the valve, and silver soldered with best grade or Easyflo. Don't make the job hotter than absolutely necessary to make the solder run freely. Pickle, wash, and clean off all burnt flux and then carefully trim the ends and sides of the rubbing face to the proper dimensions. Finally true up the face in the same manner as the cylinder portface.

When the back of the valve has to be cross-slotted for a nut and spindle and a regular milling machine isn't available, there are two ways of doing the job in the lathe without using a separately driven drilling spindle. The first (and in my experience the best) is to use an ordinary milling-cutter mounted on an arbor between centres. The valve is held in a machine-vice bolted to the saddle at such a height that the cutter can take out the full depth of cut at one traverse. If a regular machine-vice isn't available, one is easily improvised with two pieces of angle and two screws. I did plenty of them like that before I owned a milling machine. Just after the first world war I bought a "surplus" side-and-face milling cutter about 1½ in. dia. from a London tool store for a shilling. It was $\frac{3}{16}$ in. wide and did yeoman service for many years, cutting slots of any width by taking sufficient traverses.

The second method is to hold the valve in a machine-vice (regular or improvised) which is bolted to a vertical slide facing the headstock. The groove or slot is cut by a slot-drill in the chuck. The valve is set at the correct height by adjustment of the vertical slide, and fed into cut by the topslide. The slot drill can easily be home-made from round silver steel of requisite diameter. The sketch shows the shape. Harden and temper it to dark yellow.

Here is an item which will appeal to those who like small hexagon screwheads. The corners are often spoilt by using a badly fitting jaw spanner. I have already described how to make box-spanners from short lengths of steel tube, but few seem to realise that excellent box-spanners can be made from Allen screws. I have several of them. Allen screws have a nicely formed hexagon recess in the head. Choose one which has a recess that fits nicely over the head of the size of screw for which a box-spanner is required.



SIMPLE WAY OF MAKING SMALL BOX SPANNERS

HOME MADE SLOT DRILL

Soften it by heating to red and cooling slowly. Saw off the head end from $\frac{3}{8}$ in. to $\frac{1}{2}$ in. down, according to size. Chuck with the sawn end outwards, face off, centre and drill a $\frac{1}{8}$ in. hole about $\frac{1}{8}$ in. deep. Chuck a piece of mild steel rod $\frac{3}{16}$ in. dia. and the length of the required box-spanner. Turn a pip on the end to fit the drilled hole, squeeze it in, and braze the joint. Let it cool to black, quench in cold water, rechuck the rod with the brazed head outwards, turn it down almost to the diameter of the hexagon hole across the corners and trim off any surplus brazing material. Round off the other end of the rod, drill a No 43 cross-hole through it and press in a piece of 3/32 in. round silver steel to form the handle.

A form of special box-spanner which I have found extremely handy is shown in the sketch. Face the sawn-off head of the Allen screw as above, centre it and drill No 42. Fit a 4 in. length of 3/32 in. silver steel in the hole. Chuck a piece of $\frac{3}{16}$ in. mild steel, round off the end and knurl it for about 1 in. along. Part off at about 1¾ in. from the end, reverse in the chuck, centre and drill the other end No 42 for about ⅛ in. depth, and chamfer the end. Fit this on the other end of the 3/32 in. rod and braze both joints. Cool, quench, and turn down the head as above. At 1 in. from the knurled end, drill a No 43 cross-hole and fit a 3/32 in. handle.

This size is just right for 3/32 in. nuts and with it you can put nuts on screws or bolts in ticklish places with the greatest of ease. If a little blob of motor grease is put into the socket before inserting the nut, the nut will stay put, no matter at what angle the box-spanner is operated. The nut can be started on the thread and twirled home by aid of the knurled end and finally tightened by the cross handle. Little tricks like these are invaluable to those locomotive builders whose time is limited.

LBSC writes every week

THE RISE AND FALL OF THE GLASGOW TRAM

TRAMS have been the pride of Glasgow now for many years. While New York boasted of its skyscrapers, and Paris its Boulevards, Glasgow stood by its trams. This is a curious thing really, for by no stretch of imagination can trams be considered a thing of beauty. But soon Glasgow will need to publicise new features for the transition of the tram is almost complete.

In the latter part of the 19th century the horse was the main form of transport and thus it was not surprising that the first service of the Glasgow tramway system was horse-worked. This route from St George's Cross to Eglinton Toll was opened in 1872, not by a local authority but by a private company. It was not until 1894 that the municipal body took over, with some difficulty. Before the system had time to settle down it was decided to employ electric traction, a system, incidentally, which they had refused four years earlier.

The decline of the tram began in the 1920s, due to the increasing use of petrol buses which proved more versatile on the city streets. Even so trams managed to hold their own until just after the war, but since then the decline has been rapid, although not quite so rapid in Glasgow as elsewhere.

READERS' QUERIES

DO NOT FORGET THE QUERY COUPON ON THE LAST PAGE OF THIS ISSUE

This free advice service is open to all readers. Queries must be of a practical nature on subjects within the scope of this journal. The replies published are extracts from fuller replies sent through the post: queries must not be sent with any other communications: valuations of models, or advice on selling, cannot be given: stamped addressed envelope with each query. Mark envelope clearly "Query," Model Engineer, 19-20 Noel Street, London, W.1.

Naval picket vessel

My current project is a British naval boat built to a set of plans from England. Not having seen such a vessel since I was a boy. I do not know the proper colour for the hull. Is the hull a solid colour or is there a waterline of a different colour? Also, I would like to know the colour of the after deckhouse, engine-room structure, etc. Was the smoke stack ever made of completely polished brass, or just the flare at the top?

When I was in London, I looked both at Greenwich and the Science Museum for a model but none could I find. Could you tell me where I might find such a model on my next trip to London?—L.W.B., Boston, Massachusetts.

▲ *We presume you have a drawing of the boat concerned, and that the period is before the change from painting HM ships black and white to grey, which was before the* 1914 *war. If the draughts show the boat with a counter then she must be an admiral's barge. She can therefore be enamelled green with a white bottom if she is a C-in-C's barge or dark blue with white bottom if a junior flag officer's barge. Funnel and ventilators would be all over polished brass, the funnel having a bell-mouth. The after cabin, polished mahogany with brass dolphins on each side aft, curving down with tails up to the cabin roof and heads on the coaming of the cockpit. Any amount of gratings and "tiddly work," of course, and the appropriate flag officer's flag as the badge on the bows. The flag lieutenant paid for the barge's "tiddly work."*

If the draughts show a flat transom, then she is a ship's boat and can be painted or enamelled, within reason, as you wish provided it is not green or dark blue.

In those happy days the ship's boats were the joy of the commander and the midshipman of the boat, and the amount of "tiddly work" depended on the depth of their (or their parents') purses. Most ships enamelled their boats grey all over (or white if before the grey ship period), or perhaps black with white bottoms. We don't remember seeing any other colours.

The service supplied the boats with plain funnels and ventilators, but it was not long before most ships had their boats with brass bell-mouthed funnels and many with brass or copper ventilators as well. Sometimes a ship would be content to have a painted funnel with a brass bell-mouth.

Cabins were usually scrubbed teak, and engine-room casings painted to match the hull, with brass scuttle rims. Practically every fitting in the boats was of brass and kept polished. The sailors of those days loved their boats and had an intense pride in keeping them beautiful.

The grey paint, by the way, was light grey in the Mediterranean and other foreign stations, and darker grey for the Channel and Home Fleets.

Transformer windings

I have several discarded wireless transformers that I have stripped down, saving the different gauge wire, etc. Enclosed is a diagram of a typical set of stampings. From it I want to try and get an output of 6 and 12 v. (two tappings) at 5, or 6, or 7 amp., i.e. the most amperage I can from this particular one. I would like to have an output of 24 v. alone, at a reduced amperage, not less than 5 if possible.

As the amperage of the output side, 5, 6 or 7 amp., is mostly governed on 14 gauge—heavier than the wire in my possession—can I double-wind a lower gauge and get a corresponding result, i.e., wind on two lower gauges together? Can I wind a primary on each set of stampings to work off 240 v. and wind the secondary on by trial and error and take a reading with the voltmeter until I have the required number of turns to give the volts needed?

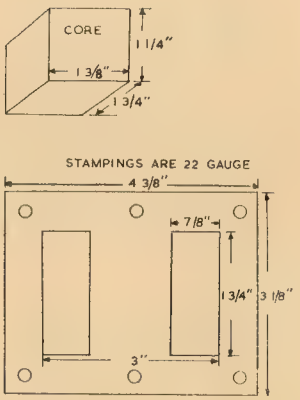
Should the gauge of the primary wire on a given set of stampings on 240 v. input always be the same, regardless of the output desired? Or should the primary gauge wire increase in proportion to the gauge and load of the output wire increasing in desired amps?

Can you tell me the gauges of wire to use, and what output and efficiency to expect on a given loading?

I would also like some practical advice on whether I can pick up a coil of, say, 34 or 35-gauge wire, take an ohmic reading to suit 240 v. input for the primary, cut off this length and wind on to one or other of the sets of stampings and calculate from this the output formula, i.e., turns per volt and gauge.

Does the ohmic value always remain the same, or has there to be the same resistance for, say, a 240 v. mains with all gauges of wire on the primary winding? Or does the magnetic flux of the iron lower the resistance of the winding when wound or play any particular part on the resistance of the winding when wound?

What is a safe reading in ohms for any coil of insulated wire to apply to the 240 v. mains direct?



I know the gauge of wire increases with the desired increase of amperage on the output of the secondary winding on a transformer or other electrical device, but does the primary winding also have to be of a heavier gauge?—H.D.W., Cardiff.

▲ *The core area is too small for the full output you suggest, but for a short rating it can be used for an output of* 7 *amp. A winding that should suit can be, for the primary,* 1,340 *turns of* 28 *s.w.g. enamel covered copper wire. The secondary will have* 66 *turns of* 14 *s.w.g. enamel covered wire, a tap is brought out at* 33 *turns for* 12 *and* 24 *volts respectively. To be able to work this transformer as a*

full rated job, you need a core area of 2.5 sq. in., and the winding calculations for this will be 3.5 v. per turn; that is, the turn value is 3.5.

Paralleling a winding is permissible providing there is sufficient room. With your transformer this will be impossible. Yes, you can wind primaries on several cores and then make an estimate by trial and error. But the windings will be different for the several cores and will have to be worked out separately. No, the primary wire cannot always be the same regardless of the eventual output of a transformer. The total output in watts is carried by the primary and a wire must be used to meet these conditions.

In your case, the total ouput is 168 w. Therefore the primary must be capable of carrying the current equal to 168 w. at 240 v. For a higher wattage the primary wire would be larger. The wire does not increase in any proportion relative to the primary, but the ratio between primary and secondary does. Although resistance exists in the windings, it is not a feature of the calculation. The resistance is incidental, and will be governed by the wire size in each case. The resistance does not cater for the flow of current. This is done by the back e.m.f. of the magnetic side of the job, that is, the cores' magnetising current.

You cannot calculate your windings using a resistance value alone. If you have more than one transformer of the same size, you can make up the required core area to suit your 7 amp. output by increasing the thickness of the stack. You will then have to make a new bobbin for the coils, and this you can do with vulcanised fibre or stiff cardboard using ordinary glue for jointing.

Primary transformers

Could you please inform me as to the output voltage and current ratings of the 230/1/50 primary transformers used on the Butt welder fitted to some bandsaw machines? Particular requirement is for a ¼ in. wide blade. —B.M.F., North Romford.

▲ *Saw blades are not welded, but brazed or silver soldered and the transformer only provides the heat for this jointing. The voltage of Butt welding transformers is 1-1.5 v., and current values up to and over 3,000 amp. are used.*

For the work you have in mind we think currents up to 200 amp. would be suitable. It is not possible to give exact figures because many things will be governed by the style of welder and the method of making the weld, and machine methods differ widely.

As we do not carry any recorded data of maker's apparatus, we suggest the best plan would be to contact the makers or suppliers of the welding plant. They should be able to furnish the data you need.

Capacitor motor

Would you kindly explain (*a*) how a capacitor functions (*b*) the terms "phase shifting device" and "split-phase type"?

Recently I acquired a Brook ¼ h.p. single-phase, 50 cycles, 240 v. motor, and I would like to understand properly how it functions. I have not removed an end to examine the inside of the motor and presume the central switch and capacitor must be housed somewhere in the body of the motor. —H.F.F., Swindon.

▲ *There are several ways in which a single-phase motor can be started, and the capacitor method is the best. It enables a greater starting torque to be obtained than with normal starting. Without going into the technical side of the design, the effect of connecting a condenser of a correct value in series with the starting winding creates a phase displacement that enables the motor to exert a considerable effort as against the normal manner of starting these motors.*

Where small motors of this class are concerned, the two windings are connected in parallel across the supply. After the motor has reached a certain speed, the starting wind is disconnected and the motor then runs on one winding only. Sometimes a resistance is used in the starting winding. In another motor there is no resistance or condenser: these methods are much inferior to the capacitor method.

The centrifugal switch inside the motor carries the starting circuit in which is the condenser. Where this switch is not used, hand methods are used for starting, special switches being provided for this purpose. It is inadvisable for you to remove the motor endshield to look at the switch as damage may be done to the connections, which are usually rather on the short side, and easily pulled off.

Some small motors are provided with a thermal overload device. This functions if the current taken by the motor exceeds a safe value. They are usually self-restoring after a cooling period. With this device and if the motor were left in circuit on overload, it would stop and, after a period, restart, run for a while and stop again and so on until the overload was removed.

Reversal of a single-phase motor is accomplished by reversing the current in either of the two windings, but not both. All that takes place is that the current is reversed in one phase, and the machine then runs in the opposite direction. It does not matter which winding is reversed, but it is usual to use the starting winding.

The date of this year's

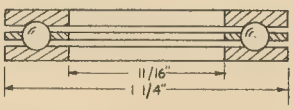
MODEL ENGINEER EXHIBITION

30 Dec. 1959—9 Jan. 1960

Ball thrust bearing

I need a small ball thrust bearing for the spindle of my drilling machine, as shown in the accompanying illustration. Would you be good enough to suggest or recommend a suitable dealer or engineering concern who would be able to supply my requirements?

Can you tell me whether American engineering tools are now being imported into this country, such as Starretts, Brown and Sharpes, etc.? I believe that trade restrictions were or are still in force regarding imports from America.—R.V.O., Upminster.



▲ *Thrust bearings in a wide variety of sizes are made by all manufacturers of this type of bearing, including:*

Skefco Ball Bearings Co. Ltd, Leagrave Road, Luton.

Hoffmann Manufacturing Co. Ltd, Chelmsford, Essex.

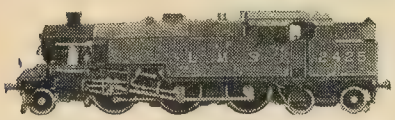
Ransome and Marles Bearing Co. Ltd, P.O. Box 18, Newark-on-Trent.

We have no exact particulars of all the sizes available and we cannot state whether anything to conform with the dimensions you specify is obtainable from stock.

There are quite a number of different types of ball bearings available on the surplus market, and we suggest that K. R. Whiston, 8 Watford Bridge Road, New Mills, near Stockport might be able to supply something fairly close to your specification.

We understand that imports of American engineering tools are still severely limited and we cannot inform you definitely of any tool dealers or agents at present handling supplies of them.

JUBILEE



The 3½ in. gauge LMS 2-6-4 tank locomotive by MARTIN EVANS

This week the author writes about steam pipe arrangements and how the mechanical lubricator can be fitted and driven

Continued from 12 March 1959, pages 332 to 334

COMING to the steam pipes to the cylinders, it will be remembered that there is a frame stretcher across the frames just ahead of the cylinders and near to the top edge of the frames. This stretcher should be removed. It is no longer required and in any case it would get in the way of the lubricator. I put it there to stiffen the frames while assembly of the cylinders, etc., was being tackled. By the time the steam and exhaust pipes are fitted and the saddle is in place, the frames will be extremely rigid. (Keep it ready for your next locomotive !)

Brass tubing ⅜ in. o.d. × 18 s.w.g. (3/64 in.) is used for the two branch pipes; both ends of each piece are threaded 32 t. The connection from the superheater is made by a ½ in. × 26 t. union. This part is best made from the solid. Chuck a piece of ½ in. dia. brass rod about 1¼ in. long, turn down to 13/32 in. dia. for a length of 1⅛ in. and drill right through ⅝ in. dia. Reverse in the chuck, face to an overall length of 1⅛ in., chamfer and thread the remaining ½ in. dia. × 26 t. Finally open out for the union with a large centre drill (60 deg. included).

Centre section

The centre part can be made from a 1 in. length of ¾ in. square brass. Mill or file this down to a rectangular section 11/16 in. × 21/32 in., mark out the centres for the vertical pipe, the cross-pipes to the cylinders, and the connection for the oil check valve on the front. Now set up the fitting in the four-jaw chuck with the last-mentioned centre running truly, and turn a little boss ⅛ in. long and about ⅝ in. dia., centre deeply, drill 5/32 in. dia. to a depth of ¼ in. and tap ⅜ in. × 40 t.

Re-chuck in the four-jaw, setting the job to run truly for the cross-pipes, and turn down the outer end to ½ in. dia. for a length of 7/32 in. Then centre deeply, drill right through with an ⅛ in. drill, opening out to 21/64 in. dia., finally tapping ⅜ in. × 32 t. Change the four-jaw for the three-jaw, and re-chuck on this ½ in. dia. to turn the other end as before. Finally drill the upper hole for the vertical pipe, to such a diameter that the latter can be pressed in, securing with a touch of silver solder.

Four locknuts can be made from ½ in. hexagon brass, all being tapped ⅜ in. × 32 t., two being made ⅛ in. long, and two 3/32 in. One final point to note before assembling—the bottom rear edge of the centre or " T " fitting needs bevelling off, or it will foul the exhaust assembly. To assemble, run the locknuts on to the two pipes as far as they will go, the thicker nuts coming on the outsides, apply plumbers' jointing compound to all the threads, then screw the pipes into the " T " as far as they will go.

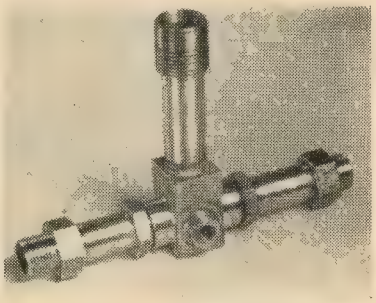
Installing the assembly

The assembly should now just go between the cylinders. If it does not, the two pipes are too long and must be taken out and shortened. On the other hand, if there is more than about 1/32 in. clearance, the pipes are too short for safety and longer ones will have to be made. Unlike the blast pipe, we are dealing here with steam at 80 lb. or so and hot at that !

When the assembly is right for length, the two pipes are unscrewed from the " T " and screwed into the cylinders, into which they should penetrate about 3/32 in.; set the vertical (union) pipe so that it is slightly leaning forward, and tighten up the four locknuts against the cylinders and the " T ". Barring accidents, we should not have to dismantle this assembly again.

The oil check valve is rather an important one. Leakage here can cause trouble in the oil feed, though if the check valve on the lubricator itself is sound, and the plunger a reasonable fit, there will be no failure. Incidentally, while on this subject, people who complain that their mechanical lubricators are not thoroughly reliable, should check over this oil check valve and the check valve on the lubricator before they blame the latter. The spring on the ball in the lubricator check valve should be *stronger* than that in the check valve on the steam pipe. This is important. It is often overlooked that the ball on the steam check valve is always held down by almost boiler pressure (when the regulator is open) but the pressure on the lubricator check valve ball *may* not be anything like so much. It may be relying solely on its spring to ensure tightness.

The reason for this is that oil is virtually incompressible, so that when the piston in the lubricator starts its return or suction stroke there is a fraction of a second delay between the closing of the steam check valve and the closing of the lubricator check valve. In this time, extremely short



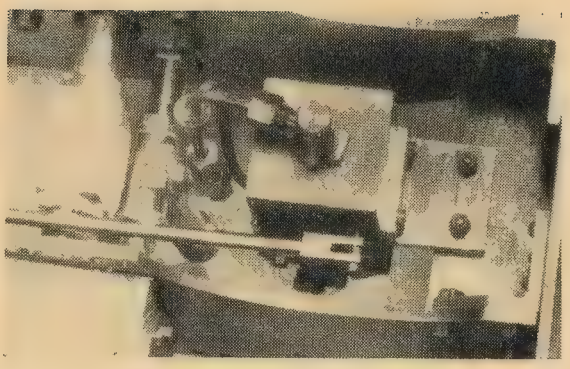
Steam pipe assembly showing oil supply inlet from the lubricator

though it is, the pressure of oil between the two valves can easily drop from the 100 or so lb. per sq. in. necessary for delivery, to atmospheric pressure.

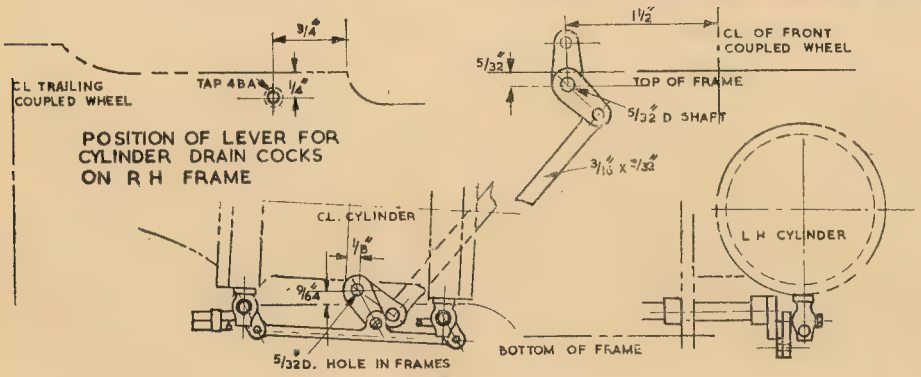
The oil check valve can be cut from the solid quite quickly. I made my own in this way, ½ in. × 5/16 in. brass bar being used. A piece about 11/16 in. long was chucked in the four-jaw, set to run truly about a centre marked 5/32 in. from the top, with about ⅜ in. protruding from the chuck jaws. The " neck " was then turned and the end turned down to ¼ in. dia. for a length of ¼ in. and then reduced to 3/16 in. dia. for a length of 3/16 in., this being screwed ⅜ in. × 40 t. to

fit the steam "T." A No 50 drill was then put in, to a depth of 11/32 in. After this the fitting was turned round in the chuck, through 90 deg. only, for forming the valve seating, a No 40 drill being used, followed by a 5/32 in. drill and D-bit. The last 3/32 in. was tapped $\frac{3}{16}$ in. × 40 t.

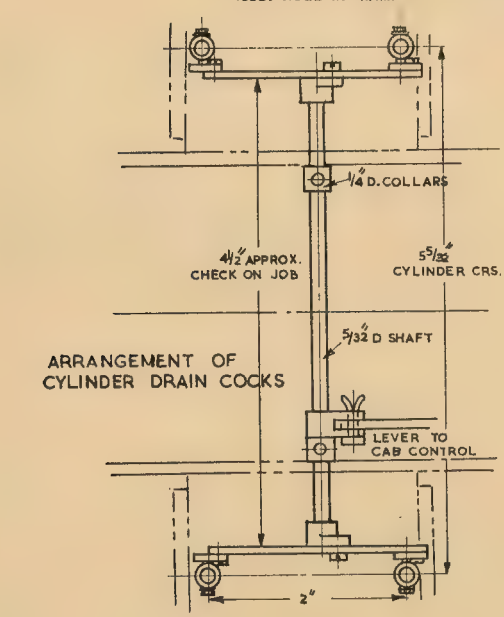
Finally the fitting is completely reversed, the No 40 through hole set to run truly, and the end turned down and threaded $\frac{1}{4}$ in. × 40 t. for a length of $\frac{3}{16}$ in., the usual union seating being formed with a 60 deg. centre drill. To finish the valve, the sides are "thinned out" to about 9/32 in. and the valve seating formed

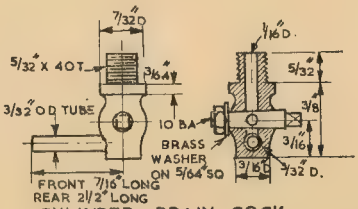


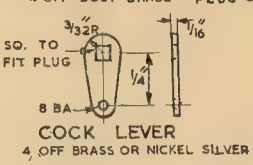
Underside view showing driving rod and fitting of lubricator

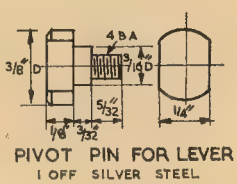


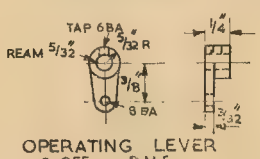
Drawings showing cylinder drain system and operating gear

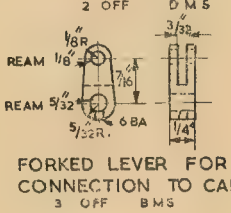


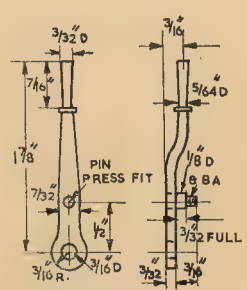


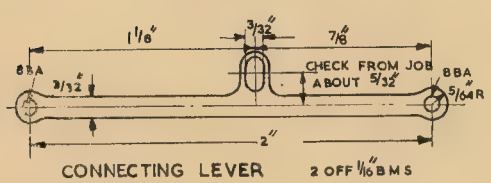












JUBILEE'S *lubricator. Note the bypass valve*

with a $\frac{1}{8}$ in. dia. rustless steel ball plus "hammer and brass rod treatment." A light steel compression spring should be wound up, the ends of which may be touched on the grinding wheel. The top cap should be hollowed out so as to locate the end of the spring in the centre of the recess.

If the check valve is built up, I would suggest that $\frac{1}{4}$ in. round brass rod, and 9/32 in. square brass rod be used, the former of course, making the branch into the steam "T" and the latter the body of the fitting. The two parts should be silver soldered together for safety.

My picture will, I think, show quite clearly how the lubricator is erected. A $1\frac{3}{16}$ in. length of $\frac{3}{4}$ in. brass or steel angle is screwed to the front of the container, and this is itself bolted underneath the flat top of the front buffer beam. The top of the container (with the cover off) should stand $\frac{1}{2}$ in. below the top edge of the mainframes, and the front edge of it should lie $1\frac{3}{16}$ in. from the extreme front end of the frames. The drive is quite straightforward, a rod about $\frac{1}{8}$ in. dia. with a little forked crosshead at each end being used. A lug is bolted to the eccentric strap of the left-hand side water pump, by its own top bolt. The rod will need bending a little to clear the underside of the blast and steam pipes but I don't think anyone should have difficulty with this.

Cylinder drain cocks are not absolutely essential with slide valve cylinders. However, I strongly recommend them, as they enable the cylinders to be warmed up and cleared of condensed water so much quicker. It is not at all difficult to arrange for the cocks to be operated from the cab on this particular engine. In my next article I will be able to give a picture showing how the necessary linkage is arranged; but for the moment let us concentrate on the cocks themselves.

The cocks are of the normal taper plug cock type and it is advisable to make up a taper reamer to ensure that the cock plug matches the body correctly.

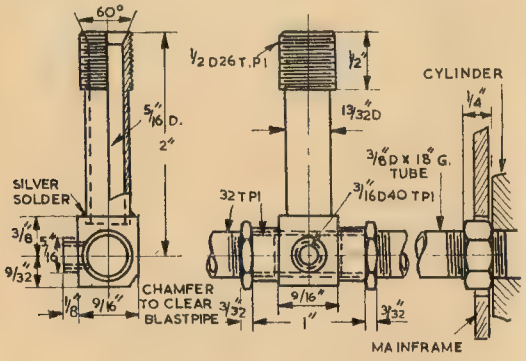
Making the plugs

The method is, of course, to turn up the taper reamer out of silver steel by setting the lathe topslide around in the usual way, and then, without altering the setting of the slide, turn up several plugs from gunmetal rod. The bodies of the cocks are turned from $\frac{1}{4}$ in. dia. brass rod, the $\frac{1}{16}$ in. drill being put through to within 1/32 in. of the bottom and a 3/32 in. dia. hole cross-drilled from the front to take the outlet pipes. This saves having to put sharp bends in the latter. After turning the plugs, fit the handles, which are made from $\frac{3}{16}$ in. × 3/32 in. brass or nickel silver strip. These are held on by the square on the plug and a touch of soft solder. This is adequate here as the cocks being in the open won't get quite so hot as the cylinder itself.

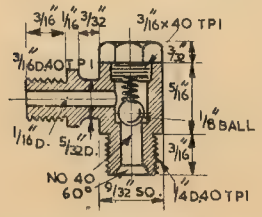
The plugs should be ground in, then washed thoroughly in paraffin before assembly. The completed cocks are screwed home into the 5/32 in. × 40 t. tapped holes in the cylinders with a smear of plumber's jointing on the threads. Next time we will go into the operating gear and cab lever.

Finally, I must apologise for an error in the general arrangement drawing of the mechanical lubricator in the March 12 issue. The thickness of the clamping nut inside the tank should be 3/32 in., not more, or the oil inlet holes would be blocked.

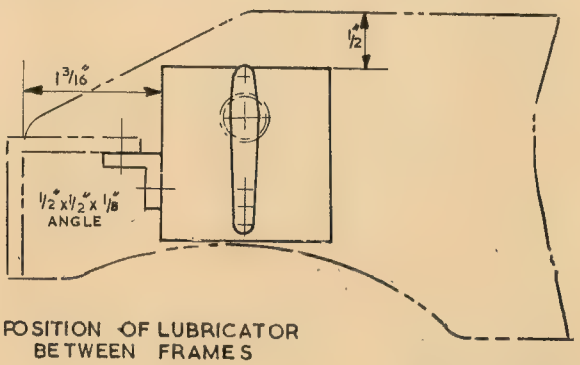
★ *To be continued on April 9*



STEAM PIPE ARRANGEMENT



OIL CHECK VALVE
1 OFF BRASS

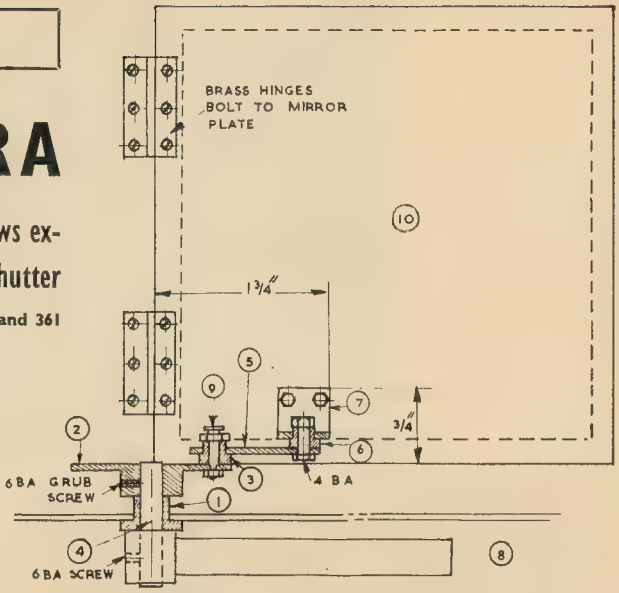


POSITION OF LUBRICATOR BETWEEN FRAMES

REFLEX CAMERA

This week EXACTUS explains how to make the bellows extension and the device that operates the mirror-shutter

Continued from 19 March 1959, pages 360 and 361



Plan of mirror control lever and linkage

THE type of mirror most suitable for reflex focusing is one which is silvered on the front surface, not on the back as for ordinary mirrors. A highly polished metal plate could be employed, if its surface could be guaranteed absolutely flat, but this is difficult to ensure in practice; glass, on the other hand, can be made very accurate, and will remain so unless forcibly distorted by bad mounting.

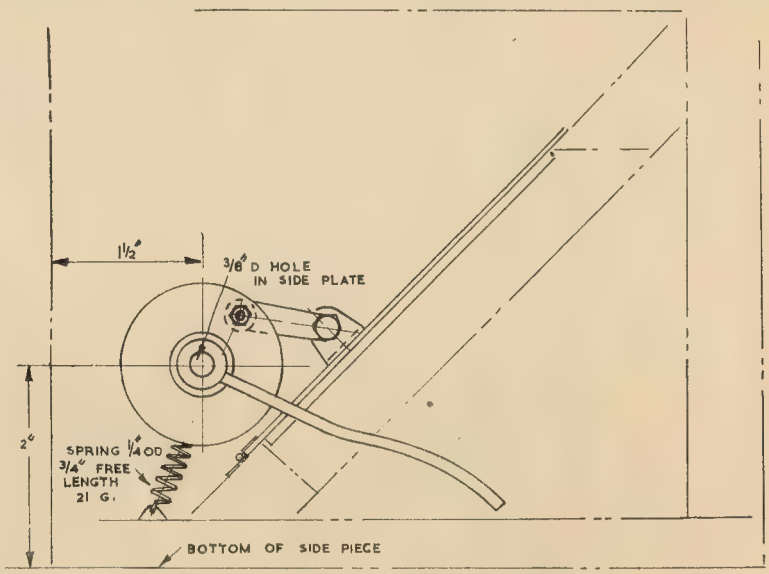
The trouble with back silvered mirrors, is that as the front glass surface acts as a reflector as well as the back, they are liable to produce a double reflection which makes accurate focusing difficult. Surface silvered mirrors are not unduly expensive; the 4 in. × 4 in. mirror employed here was obtained for less than £1. It has an aluminised surface, which is recommended in preference to ordinary silvering, for superior reflectivity and lasting lustre. In mounting the mirror on its panel, only light clips should be used, so that there is no risk of springing it out of truth, but it should not be free to rattle, and should obviously bed down fairly all over.

Focusing extension

The time-honoured method of varying the extension of a camera by bellows is difficult to improve upon. But other methods are possible, such as the use of telescoping tubes or boxes. In some modern enlargers, the lens is mounted on the end of a large sleeve which is spirally adjustable inside another. In such cases the latitude of adjustment is not subject to possible interference by the internal mirror, as in this case. A fairly large range of extension adjustment is necessary for focusing at distances varying from a few inches to one or two feet, and a bellows provides this in the simplest way.

The bellows used in this case was obtained from an old ¼-plate folding camera, picked up cheaply on the second-hand market, but new bellows of a suitable type are not expensive. In recent years bellows moulded in one piece from p.v.c. or similar plastic materials have been obtainable. It is not beyond the ability of model engineers to make their own bellows from leatheroid or bookbinder's cloth, but folding the creases neatly is not as easy as it looks. The bellows should, of course, be large enough at the front to provide an ample aperture for the lens, and at the back to avoid cutting off the margins of the cone of rays. The fully extended length should be about 6 in., which is about usual in single-extension ¼-plate cameras.

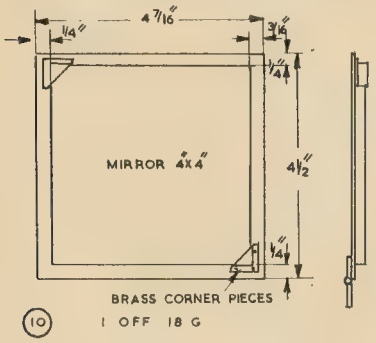
The bellows can be attached to the camera body by cementing directly to the lower panel, but if it is desired to make the bellows detachable, a sub-panel of wood or metal can be fitted, attached to the camera by small screws. This applies also in fixing the bellows to the lens panel; the use of a latex adhesive such as Pliobond is preferable to ordinary glue or cement, which is liable to



Side view of mirror-cum-shutter control

become brittle. In some cameras the bellows is attached to the lens panel by an internally inserted metal panel, with a ring nut, which not only secures the lens, but also clamps the front fold of the bellows, and avoids the necessity to use adhesives.

The device for operating the mirror-cum-shutter from the outside of the camera is quite simple in construction, but gives a snappy action with positive location in both open and closed positions. It consists of a disc crank on the inside, operated by an external lever, and connected by a short link to an angle bracket on the back of the mirror panel, as shown in the side and plan views of the assembly. A tension spring anchored between the crankpin and a small bracket fixed to the bottom panel gives a tumbler action, tending to throw the panel to its extreme position in either direction. The bias is slightly upward,



Mounting mirror on hinged panel

to compensate for the weight of the panel; this will depend on the tension of the spring and the position of the lower anchorage, which may be made adjustable if desired.

Perhaps it should be explained to avoid misunderstanding, that a shutter of this type is only suitable for time exposures, and cannot be used in a reflex camera intended for general photographic work.

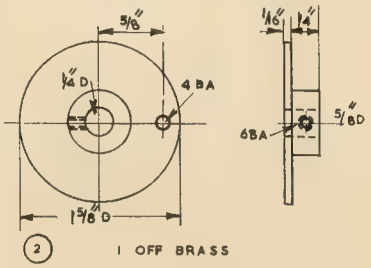
Part 1 is the bearing bush for the crank spindle, which is turned from brass, with a flange for attachment to the side panel by screws or rivets, in the position shown in the assembly drawing. The centre is drilled and reamed to take a $\frac{1}{4}$ in. spindle (Part 4) made from a plain piece of silver steel rod $1\frac{1}{4}$ in. long. Part 2 may be turned from brass bar $1\frac{5}{8}$ in. dia., if available, but otherwise a disc of $\frac{1}{16}$ in. sheet brass may be used, with the hub either riveted or sweated in. It may be attached to the spindle either by a 6 BA grubscrew, with the point sunk into a dimple or on a flat, or by a taper pin, the latter being a more positive means of securing permanently.

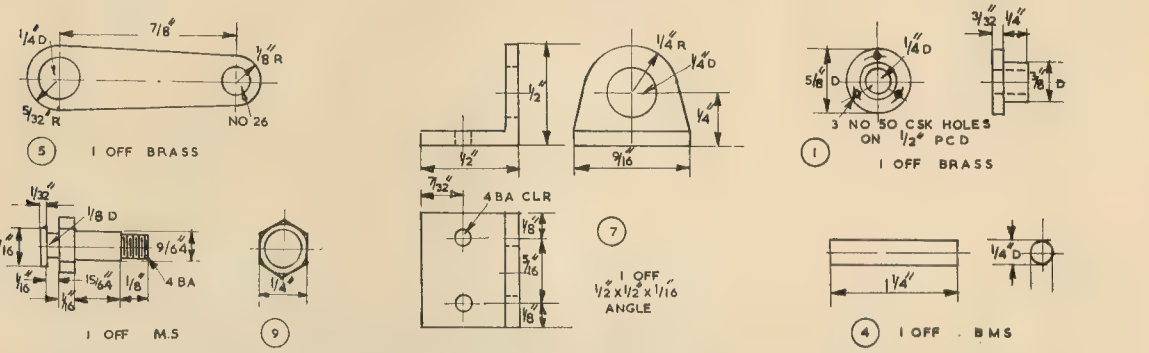
The link, part 5, is fitted with a bush, part 3, which may be pressed or sweated into the large end. It is reamed 9/64 in. to fit smoothly on the crankpin 9, which is screwed and lock-nutted into the crank disc 2. Note that this pin has a grooved extension from the hexagonal (or round) head, to provide an anchorage for the tension spring.

Angle brass, $\frac{1}{2}$ in. × $\frac{1}{2}$ in. × $\frac{1}{16}$ in. is most suitable for making the bracket 7, which is attached by two screws to the mirror panel; alternatively, it may be bent at right angles from $\frac{1}{16}$ in. sheet. A bush similar to that in the link is pressed or sweated in, to take a pivot pin made from a 4 BA bolt with a plain shank, screwed at the end for just a sufficient length to allow of screwing the nut on tightly to take up end play without interfering with free working. A similar, but smaller angle bracket, not shown in the detail drawings, may be used to provide the lower spring anchorage.

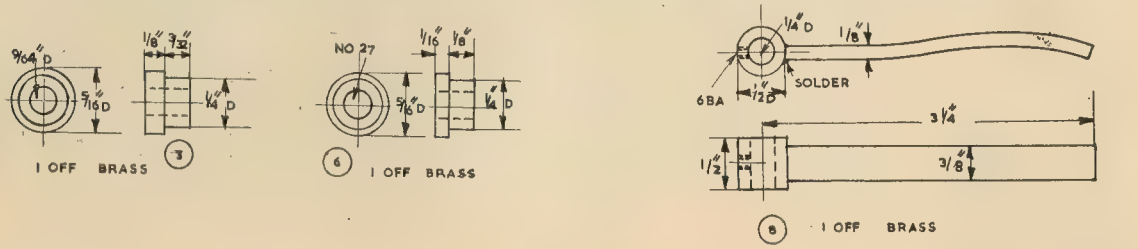
The control lever, part 8, may be made from solid brass, or built up by filing or turning a round tenon on the end of the flat strip, and silver soldering it into the boss. When its convenient working position, relative to the crank, has been found, it may be fixed to the spindle by a sunken grub-screw or a taper pin. The shape and size of this lever is optional.

★ *To be continued on April 2*





Components of shutter control gear. Above: (left to right) crankpin and connecting link, mirror frame angle bracket, details of disc crank, bearing bush and spindle. Below: Link bushes and operating lever



POSTBAG

The Editor welcomes letters for these columns. A PM Book Voucher for 10s. 6d. will be paid for each picture used. Letters may be condensed or edited

PRESERVING LOCOS

SIR,—The question of finding available space in order to preserve some of the locomotives at present running, has recently been discussed by Vulcan, and I should like to put forth the following suggestion.

I consider that there would be plenty of room on the larger island platforms at the various main line stations, and this would enable passengers to view the locomotives if they so wished.

As regards their upkeep, I do not think one would have any difficulty in getting schools or societies to "adopt" the locomotives.

Another subject which you have recently discussed is the provision of workshop copies for various designs published in MODEL ENGINEER. Would it not be possible for the printers to make extra copies of the pages relating to, and including, the design? These could then be stapled together, and sold either with or without the appropriate plans. The fact that there would be some extraneous matter on some of the pages would be of no consequence; anyway, I would imagine that you have had sufficient experience to enable you to foresee the various items which you consider advantageous to print.

Kisumu, Kenya. L. SAUNDFORD.

* *Sorry. The idea of extra copies of workshop designs has been considered and rejected as impractical.*—EDITOR.

READERS' QUERIES

SIR,—As one of those who deal with the query service, I would like to ask all enquirers with problems affecting electric motors, to give the fullest details of their machines. Slot area is important in working out an altered winding, etc., and the slot measurements should be fully stated, their width both at top and bottom, and the depth. Where a stator is concerned, the thickness of the iron below the slot should be given. If possible a rubbing should also be sent, or a full size sketch of the slot. The brush position is also required.

MODEL ENGINEER does not keep a record of makers' apparatus from a design point of view, and quoting nameplate data is useless, except to the actual manufacturers. If these points are observed, much time and postage can be saved, and a better service given.

Enfield. J. W. COOPER.

WRONG IMPRESSION

SIR,—The North London SME feels that Vulcan may have conveyed a wrong impression when, referring to the invitation to visit Mr H. G. Harrison, of Southgate, contained in Jason's article in the January 1 issue, he said [Smoke Rings, January 29]: "I wonder how many people responded to the invitation issued by Mr Harrison to visit his workshop?" and ". . . a gesture like this, could very well be the nucleus of a new club where the model engineers are not representative in a body in Enfield, Edmonton and the Southgates."

I wonder if Mr Harrison along with the score or more ship modellers have heard of the NLSME which caters for these areas, and has many members?

We are, in fact, holding a model engineering exhibition at St Andrews Hall, New Southgate, between September 7 and September 12. We intend to invite Mr Harrison and others to join us.

Enfield. RAYMOND BURTON, *Publicity Officer, NLSME.*

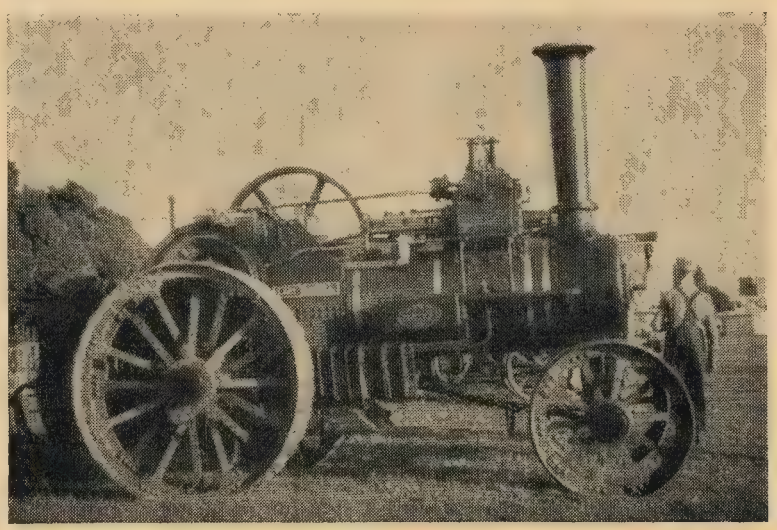
* Vulcan writes: *Mr Burton has misread and misquoted me, as he will see if he refers again to the note in question.*—EDITOR.

STILL GOING STRONG

SIR,—This photograph of my 1898 Burrell was taken at the City of Worcester Show and Engine Rally. She is a 6 h.p. single crank compound general purpose agricultural engine which left the works at Thetford on November 23, 1898 and was sold new to Noah Paxman, of Clifton Hampden, Oxon. This firm was purchased in 1908 by R. J. and H. Wilder, of Wallingford, Berks, who used the engine for threshing work until about 1951 or 1952. It was then sold to Mr Spence, of The National Standard Co. Ltd, of Kidderminster who purchased it as a hobby.

Shortly afterwards a Mr W. Carey-Walker, of Worcester took it over for the same reason and then last year I acquired it to try and keep it going.

Worcester. JOSEPH L. THOMAS.



Lady Burrell, a single crank compound engine owned by Mr J. L. Thomas, of Worcester, who tells its story in the letter above

" In the good old days of steam and smoke and soot " is how Mr C. T. Steeb, of San Diego, California, captioned this picture of the Chicago and North Western Railroad at Jewell Jet, Iowa

SMOKE SCREEN

SIR,—I enclose a photograph of one of the odd things pertaining to the railroad world—a great soft-coal smoke scene on a " clear day otherwise."

San Diego, California. C. T. STEEB.

THE GREAT EASTERN

SIR,—R. N. Thomas [Postbag, January 15] when giving information regarding John Scott Russell's *The Modern System of Naval Architecture*, says that Scott Russell designed the Great Eastern. In the interests of truth and to acknowledge the work of a truly great engineer, this erroneous statement needs to be corrected.

Scott Russell, although reputedly a good shipbuilder, was a man of doubtful character and his connection with the Great Eastern was not that of designer but of the holder of a trust which he miserably betrayed.

The misplaced trust was, of course, that of Isambard K. Brunel who was, in fact, the designer of the *Great Eastern* and it was in this ship that he included many new principles of ship construction.

Brunel suffered great disappointment during the building of his mighty ship, so much so, that his death occurred shortly after the launching. A large measure of his disappointment was due mainly to the actions of Scott Russell throughout the whole project. Let us not, therefore, add insult to injury by crediting Russell with the design.

Larbert. A. AITKEN.

NEW MODELS

SIR,—Concerning your remarks about new constructional articles [Smoke Rings, January 15]. I have been a reader of ME for over 40 years, and must agree that most subjects have been fairly well covered. But I would like to make one or two suggestions.

Though stationary steam engines, showman's engines, etc., make a great appeal to me, I have always felt that the hot-air engine has not been sufficiently dealt with. I can call to mind one or two well designed but rather complicated engines appearing not so long ago. But what about a design for a simple one, a little more substantial, and a little larger than the toy variety which would not take too long to make ?

Changing the subject, most engineers, I believe, are not too fond of woodwork, but in this " do-it-yourself " age they no doubt have to get down to it. I believe that a design for a small bandsaw, if necessary made largely without castings, would appeal to many readers. This could be followed by a still more attractive article on the making of a small universal woodworker, incorporating saw bench, lathe, morticing and tenoning arrangements, etc., which would be a great help to the model engineer when engaged on pattern making.

Finally, what about a small petrol-driven garden cultivator, possibly building into it one of the petrol engines for which numerous designs have already appeared in ME ?

Bristol. G. G. PERRY.

IS DRILLING SCREWY ?

SIR,—Though other readers may be astounded to see the picture of the V-shaped drill [Smoke Rings, January 8] as predicted by Michael Oxley in his 1955 spasm, I am not in the least surprised, as I have already had a drill unwind itself. But this was due to using excessive pressure and not, as Mr Oxley suggested, by running the drill in reverse. Reversing a drill would overwind it as in his sketch *C*.

I wrote to Mr Oxley a few weeks ago pointing out this most misleading error and also sent him the unwound drill to prove my point. Perhaps Mr Oxley will let you have this drill so that it can be photographed and published as a horrible example to all model engineers.

I would offer my sincere condolences to Mr Uridge on the loss of a good drill. I was very sad when I broke mine. These drills are a high class product and cost 3s. for a packet of eight. Their origin is somewhat obscure since they are merely stamped " Foreign." Such secrecy is, of course, essential as otherwise there would be grave danger of sabotage from the higher priced competitors.

METHANIDES.

SIR,—I reckon the short answer to your Smoke Ring under the heading " It can happen " [ME, January 8] is: but can it ? Just suppose for a moment that the drill were hard enough at the tip to cut at all but soft enough, way down the shank, to bend all that much; think of the intricate convolutions that drill would have to perform several hundred or thousand times before the point broke through as shown in the photograph !

Of course, if it works, Mr Uridge has hit on something quite valuable. Next time I want a U-bolt for a motor-car spring I shall certainly give his process a trial. It should be a new use for old drills. Unfortunately one would have to arrange to cut away the metal from all round the drill when the required shape had been obtained, but that should not prove an insuperable difficulty.

However, by an intricate and abstruse calculation, involving torsional stresses and boiling points, I have established that the drill would probably (*a*) break, (*b*) melt, or (*c*) do both at once. The problem of whether the drill or the operator would become fatigued first is less easily resolved as a purely personal factor intrudes.

No sir, Michael Oxley is not our only skilled leg-puller.

London, W1. JOHN H. AHERN.

LOCK NUTS

SIR,—Mr R. Abbott takes issue with Mr K. N. Harris, author of *Model Stationary and Marine Steam Engines*, over the latter's views on the fitting of lock nuts [Postbag, January 15]. The advice given by Mr Harris is, in fact, in accordance with that given in most of the standard works on machine drawing and design.

With the nuts in this position—i.e., the thin nut on the bottom—the recommended procedure is to first fully tighten the thin nut and then to run on the outer full nut, pulling it up to take the weight and if necessary slightly turning the inner thin nut

back to take up the clearance in the threads.

With this method, the action of tightening the outer nut is to extend the bolt slightly, the inner nut at first acting as a washer as stated by Mr Abbott. Further tightening of the outer nut or slight running back of the inner nut takes up the clearance in the threads of the thin nut and brings pressure on to the opposite thread flanks from the outer full nut, which is now taking the load in the bolt.

In practice, this method is open to the objection that a thin spanner is needed to hold the inner nut while tightening the outer nut and the inconvenience of this arrangement has no doubt been the principal reason for the adoption of the alternative procedure given by Mr Abbott.

Louth. A. G. BURDETT.

would send them to me. I will send the postage and a letter thanking the benefactor to as many readers as I can. But I would not advise sending less than six of anything as it probably won't be worth spending postage for small amounts. I would prefer photographs of foreign, obsolete or unusual types of locomotive.

40 Melody Road, D. SLOAN.
Biggin Hill, Kent. *Aged* 13.

AXLE PUMP EFFICIENCY

SIR,—With reference to the letter from Mr F. Massey, concerning axle pump efficiency [Postbag, February 5] I have found that in 2½ in. and 3½ in. gauges small locomotives suffer from oscillation on the compression stroke of the pump. At the high speeds these locomotives attain, this can be serious.

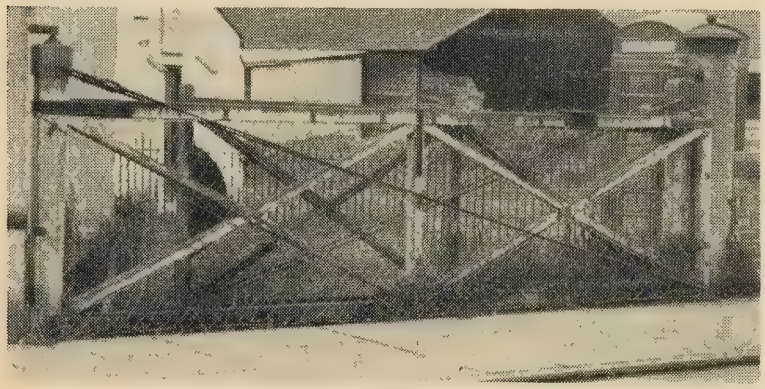
In the larger gauges the volume of water that has to be compressed causes serious strains to be imparted on certain parts of the engine and in view of the speeds that these larger locomotives achieve, I cannot see that this does any good to the locomotive.

Concerning the fitting of some form of gearing down to the axle pump, as the space between the frames is already restricted and inaccessible, I don't think that a sufficiently robust mechanism could be constructed to withstand the wear caused by the ash and grit thrown up from the track.

My own feedwater arrangement is to have one or two cross-head pumps, preferably two injectors, one working on 20-60 p.s.i. and the other on 60-100 p.s.i., and also a hand pump for pumping up from cold or in case of emergency.

If Mr Massey requires further information and cares to contact me, I would do my best to assist him.

Walthamstow, E17. D. JACKSON.



Thousands pass these old level crossing gates unaware that they were once a feature of the Lynton-Barnstaple Railway, closed in 1935. *The picture is from Mr J. Davies, of Bideford*

OLD LEVEL CROSSING

SIR,—Here is a photograph of the level crossing gates of the late lamented Lynton-Barnstaple Railway. They are all that is left to the public in Barnstaple Town and are situated in the Pilton Road and passed unnoticed by thousands of holiday-makers each year. Perhaps the Talyllyn and Festiniog Railway would note.

Bideford. J. DAVIES.

COLLECTER

SIR,—As I am collecting photographs of steam locomotives and steam rollers, I would be very grateful if any kind readers who have unwanted photographs, negatives, MEs or copies of *Model Railway News*

STEAM v. DIESEL

SIR,—Although I like steam locomotives very much and in fact am building a 3½ in. gauge model of one, I feel that the only result of the efforts of your pro-steam and anti-diesel correspondents will be to strengthen the case of the Railway Conversion League who would like to see our railways remain working museums in order to provide an excuse for converting them into roads. Personally I would much rather see a railway operated by atomic power than have no railway at all.

Apart from the questions of efficiency and economics, there is the preference of the general public to consider, who, after all, provide most of the revenue of British Railways. The fact that every single diesel or electrical conversion made to date has resulted in a substantial increase in traffic shows where the public's preferences lie. The most recent case of which I have details is the substitution of diesel railbuses on the Northampton-Bedford-Hitchin line. During October 1958 more than 7,000 passengers used the service, which is more than twice the number carried in October 1957 when steam trains were in use.

The fact is that the public are becoming more and more bus- and coach-minded and if the railways are to retain and gain traffic they must provide a similar sort of vehicle on the railways. Thanks to the modernisation plan this is being done, and very successfully.

Birmingham. D. F. FELTON.

SIR,—Referring to the recent correspondence on the subject of diesel v. steam traction, your contributors who favour steam have omitted to mention what to my mind is the biggest weapon in their armoury—the fact that the diesel changeover is, on the admission of BR Executive, only a temporary phase. The final solution will be straight electric trains drawing their power from nuclear power stations. To spend all these millions not only on the diesels themselves, but on the elaborate servicing facilities and staff training arrangements, for what is only a transitional period, seems to me the height of madness.

London, W1. R. M. EVANS.

★ *This is the final selection of letters on this subject.*—EDITOR.

CLUB NEWS

Send news and notices to The CLUBMAN, 19/20 Noel Street, London, W1.

ALTHOUGH in the last 100 years there have been many competitions at Highgate Pond organised by the Highgate Model Yacht Club, this year is the first time that one has been organised by the Highgate Model Boat Club. The competition is to be held on June 7.

The course, according to Mr Eric Pritchard, the president, will be of rhomboid shape, approximately 300 yards long. Owing to the depth of the pond it has been decided that hydroplanes cannot be allowed to compete. One other stipulation is that all diesel boats must be fitted with adequate silencers and oil traps.

Events will begin in the morning with an 80 yards nomination race. This will be followed by a straight running race over 80 yards, points being awarded according to accuracy.

In the afternoon, there will be a radio controlled steering race in which the rhomboid course will be used. The event will be open to four classes: 1. Electrical craft; 2. c.i. engines up to 5 c.c.; 3. c.i. engines from 5 to 10 c.c.; and 4. i.c. engines of 10 c.c. and upwards. Winner of class 1 will be the boat with the fastest clock time for one lap. Winners of classes 2 to 4 will be the boats with the fastest time for three laps.

After tea there will be a relay race over a specially designed obstacle course. The programme finishes with the presentation of prizes.

BIRMINGHAM SOCIETY'S JOURNAL

After editing the *Journal* of the Birmingham Society of Model Engineers for over two years Mr D. W. A. Purves has decided to resign because, owing to a change of address, he feels he cannot continue to attend meetings regularly and therefore keep up a satisfactory standard for the magazine.

The latest edition of the *Journal* contains many interesting articles, two of which are worthy of special mention. The first is Diesel Link by Marjorie Thornhill who describes a journey by diesel across the Pennines from Whitby Town to Penrith, a route served exclusively by this form of transport.

The other is Mr J. Bragg's report on last year's National Rally. Although he was disappointed at not seeing any particularly unusual locomotives he was pleased to see that the standard of workmanship on most locomotives was high. Due to the large number of locomotives on the track at one time, Mr Bragg was unable to see as much as he would have liked of the larger locomotives.

This year's rally is being held on September 5 and 6. Those wishing to attend should contact the secretary, Mr J. E. Guy, 21 Kenwood Road, Bordesley Green, Birmingham 9.

TAUNTON'S RALLY

With the coming of summer, traction engine rallies will be held again. One of the most popular is the Taunton Traction Engine Rally which is to be held at Moor Farm, Taunton, a site easily accessible for the public since the local bus services terminate there. As well as the great steaming monsters it is hoped that once again a fine display of veteran cars will be on view and there is a possibility that there will be a number of motorcycles as well.

Details concerning the rally can be obtained from Mr R. J. Smith, Blaisdon House, Cross, near Axbridge, Somerset.

NORTH LONDON FACILITIES

Some time ago Jason drew attention to an invitation extended by a ship modeller, Mr H. G. Harrison, of New Southgate, N.11, to other modellers, who were invited to call at his home and see his work in progress. The matter was subsequently commented on by Vulcan [ME, January 29] who wondered how many people responded to the invitation and suggested that such a gesture could well be the nucleus of a club in areas where model engineers had no representative body.

I see that the subject is again referred to in the current issue of the North London SME News Sheet, in which their chairman, Mr G. Cashmore, of Golders Green, NW, suggests that the paragraphs are a challenge to the NLSME.

He goes on to ask a series of pertinent questions and concludes that if they cannot be satisfactorily answered, it is proof that the society's need for publicity is great. I agree. Let's hope that ME can draw the attention of all isolated modellers in the area to the facilities offered by this admirable club.

ABERDEEN'S MEMBERSHIP

Twelve years ago when it was formed, the Aberdeen MES had over 40 members. Today, according to Mr Norman Watson, there are fewer than half that number. This seems a pity. It is also somewhat strange.

I find it difficult to believe that a city of the size of Aberdeen has fewer than a score of model engineers sufficiently interested in their craft to attend meetings of a club formed for their benefit. How about it? Recently the Society changed its premises. They are now at 21 Adelphi Lane, Aberdeen, and visitors are welcome any Friday evening.

The society has under construction a new 3½ in. gauge track which is about 200 ft long and is to be opened this summer. Anybody in the area with a suitable engine is invited to contact the secretary at 4 Davidson Place, Aberdeen.

CLUB DIARY

Mar. 27 Lincoln Model Engineering Society. Working party at Boultham Park.
Mar. 28 Harrow and District MES. Opening day of the track at Headstone. 2.30 p.m.
Mar. 28 Warrington and District MES. First run of the season on track at British Legion Club, Earlestown.
Mar. 29 Malden and District SME. Grand Easter opening. Visitors invited.
Mar. 29-30 York City and District SME. Track meeting at Bishopthorpe.
Mar. 30 Lincoln Model Engineering Society Track day at Boultham Park.
Mar. 30 Crosby Model Club. Annual get together. Coronation Park Pond, Crosby. 2.0 p.m.
Mar. 30 Malden and District SME. Track Day. Visitors invited.
Mar. 30 Leicester SMEE. Running Day at club track, Abbey Park. 2.0 to 6.0 p.m.
Mar. 31 Hastings SME. "Loco Retrospect": talk by C. Parslow, Welfare Room. 7.30 p.m.
Mar. 31 Model Railway Club. Annual Exhibition, Central Hall, Westminster. March 31 to April 4.
April 1 to 4 Nottingham SMEE. Annual exhibition, Victoria Baths Hall, Nottingham. Exhibition organiser Mr D. T. Thornhill, 26 Cromwell Road, Beeston, Notts.
April 1 Leicester SMEE. Illustrated lecture by Mr J. McCann, "General railway subjects" Belgrave Road Methodist Church Hall. 7.30 p.m.
April 1 Harrow and Wembley MES. Committee meeting at Heathfield.
April 2 Romford MES. Bits and pieces night. HQ Red Triangle Club, Romford.
April 2 Newtown and District MES. First annual meeting at the club room.
April 2 Rugby Society of Model and Experimental Craftsmen. Talk by W. J. Hughes. "A century of British Steam Road Traction," at Percival Guild House, Rugby. 7.30 p.m.
April 2 Huddersfield SME. "Ought it to be?": a controversial talk by Mr. B. W. Dawkins, Highfields, 7.30 p.m.
April 2 Worcester and District MES. Talk on design and layout of locomotive valve gear by A. Castle.
April 2 Hull SME annual meeting.
April 3 Dublin SMEE. Ships of the narrow seas, Mr Tramp.
April 3 Rochdale SMEE. General meeting (members' work). Lea Hall, Smith Street, Rochdale. 7.30 p.m.
May 10 Los Angeles Live Steamers. Spring meeting, Griffith Park. Programme arranged with Southern Pacific and Union Pacific.

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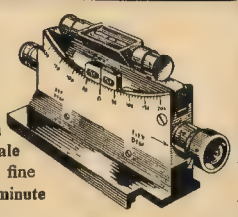

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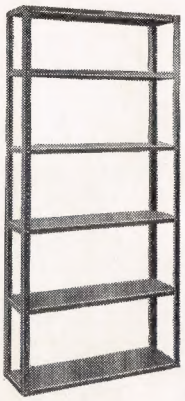

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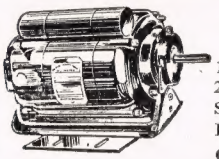

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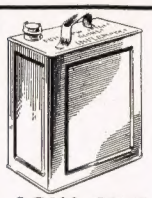

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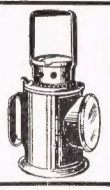

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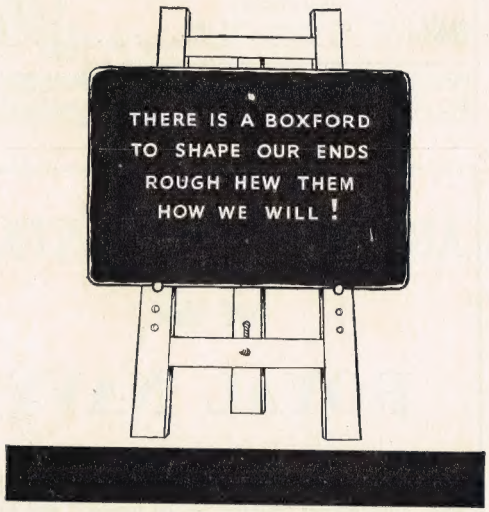

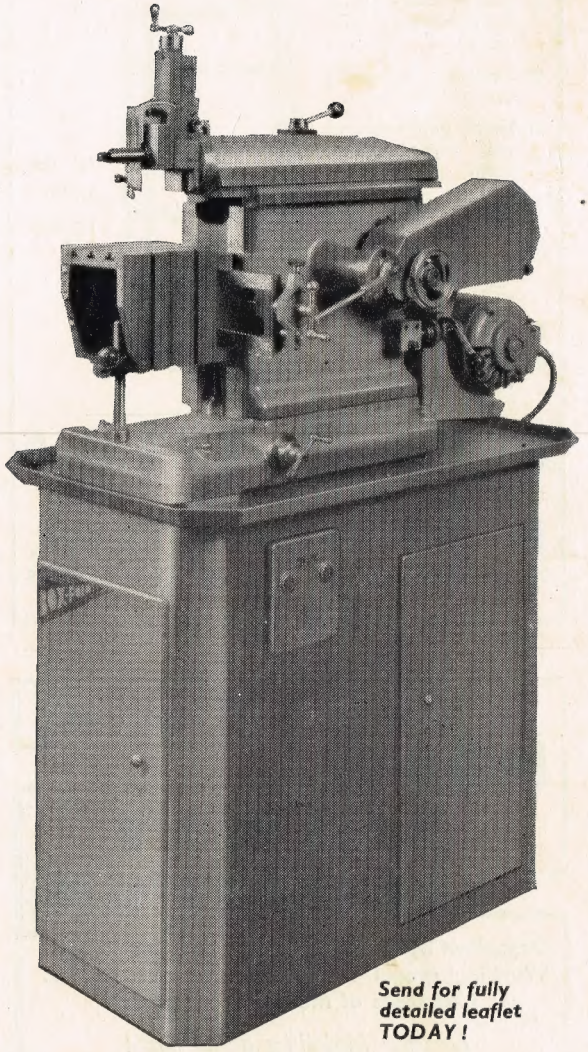

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